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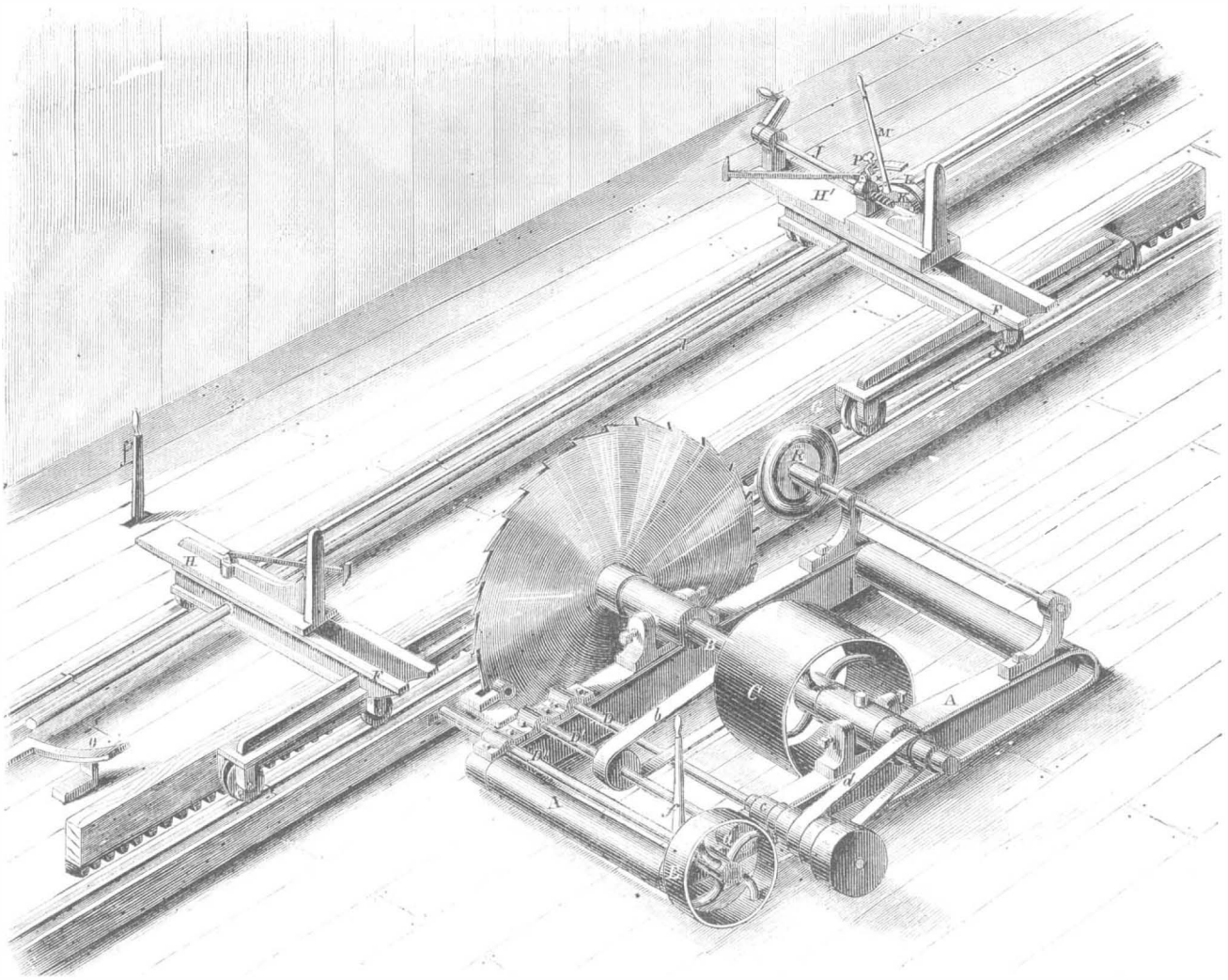
Improved Sawmill.

This cut represents an improved circular sawmill, with patent hand and self-setting rig, feed and independent headblocks, doing away with the large, heavy carriage that is generally used. A A is the frame on which the saw arbor and feed works are mounted. B is the arbor, with the main driving pulley, G, on it. R is the spreader, D D′ D″ are the feed shafts, on the inside end of D″ is a pinion for drawing the log, and on the outer end is the large internal and external friction wheel, E. On the outer end of shaft, D′ is an internal friction pulley, *a*, driven by belt, *b*; this runs the log back. On the outer end of shaft, D, is an external pulley, *c*, driven by belt, *d*, and cone pulleys for different feeds; these feed the log to the saw. The outer end of shaft, D″, is hung in an eccentric box, and is operated by levers, *f f*, by either of which the wheel, E, is brought in contact with either of the friction pulleys, *a* or *c*, and when upright it will not touch either, but leaves the head blocks stationary, to receive a log, without the necessity of stopping the saw. F F are the head blocks for supporting the log. These blocks are mounted on rollers, shown at *c c′ c″ c‴*; rollers *c* and *c″* being grooved. These blocks are connected to rack, G, by a pin not shown, so that they can be easily separated or closed for different lengths of logs, by pulling the pin out and running either of the blocks along. In sawing long timber three or more blocks are used, and an endless chain is employed in place of the rack, G. H H′ are slides for setting, being operated by a rack underneath and pinions on shaft, I. On the slide, H′, is an extra slide, operated by crank screw, J, for moving the top of the log forward or the butt backward. The screw can be used on each block for setting, in place of the shaft, I, and the rack and pinion underneath when required. L is an internal ratchet, fastened on shaft, I. C is a loose disk, supporting fingers that play into the ratchet wheel, L, and the lever, M, that has a small roller on its lower end. When the log is first on it is set by hand, through lever, M, and after the log is turned down the lever, M, is dropped down on to pin at *x*; this brings the lower end of the lever in contact with the spiral wedge, *o*, causing it to revolve the shaft, I, and set; it can be fastened to any thickness, while running, by moving the slide, P, up or down on the scale, and fastening by the thumb screw.

This machine has been patented by A. P. Walbridge, in the Canadas and in the United States, and for any further information concerning the patent parties may address him at Malone, N. Y. For any further information in relation to the machines address C. C. Whittelsey, manufacturer, at Malone, N. Y. [Mr. Whittelsey is a manufacturer of machinery and his card may be found in our advertising columns.]



WALBRIDGE'S IMPROVED SAWMILL.

POWDERED CHARCOAL.—Charcoal dust proves to be even a greater disinfectant and preservative than had been supposed. Rev. Dr. Osgood has exhibited to the editors of the Springfield (Mass.) *Republican* a cutlet taken from a ham which had been kept eight years completely imbedded in that preparation, and which seemed as sweet as if it had been cured only a single season. Such being the case, charcoal would be invaluable for packing provisions for long voyages in warm climates, and much more attention should be paid to its use.

[We find this paragraph "going the rounds," but it is calculated to mislead. Charcoal is a very powerful disinfectant, but careful and repeated experiments have shown that it has no power of preserving meats from decay. Mr. Johnson, of this city, kept the body of a mouse buried in a small vessel of charcoal in his room until it was all decayed except the bones, and no odor was perceived during the whole time. The offensive gases resulting from the decomposition of animal matters are absorbed by charcoal, but their formation is not retarded by it. It was doubtless salt ham that Dr. Osgood exhibited. —EDS.

FORMERLY the pressure of steam in locomotive boilers was 100 lbs. on the square inch, now it frequently ranges from 150 to 200 lbs.

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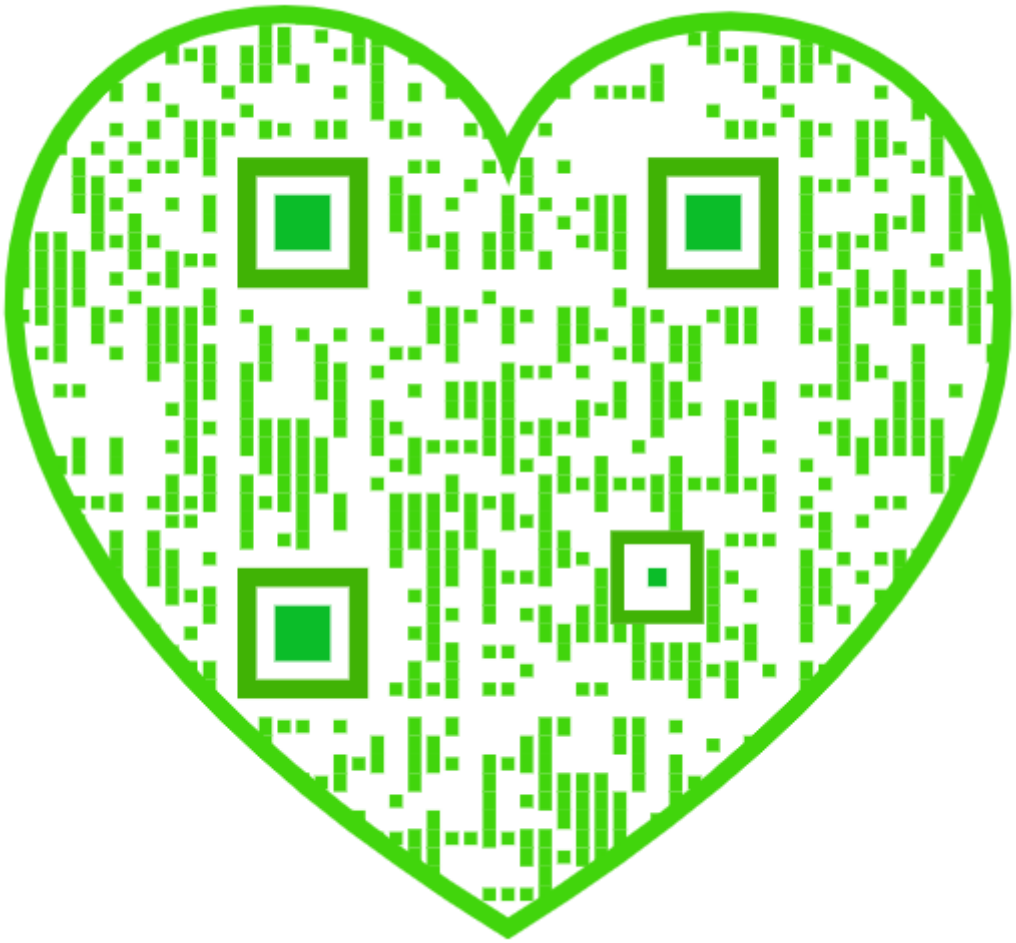

NOTES ON MILITARY AND NAVAL AFFAIRS.

After the accession of Secretary Stanton to the head of the War Department, an order was issued by the President to all of our generals in command of armies to advance upon the enemy on the 22d of February. Though movements were long impeded by impassable roads, yet in the few weeks which have since elapsed the operations have been of the most brilliant and satisfactory character. We have had important successes at Fort Henry, Fort Donelson, Columbus, Bowling Green, Roanoke, Newbern, Port Royal, Fernandina, Brunswick, Cedar Keys, Apalachicola, Jacksonville, New Madrid, Island No. 10, Pittsburgh Landing, Huntsville, Bridgeport, New Orleans, Fort Macon, Farmington, Fort St. Philip and Fort Jackson; and, what is very remarkable, in all the season so far, not a single reverse. It took us about a year to get ready, but now that we are prepared, our armies seem to be moving down upon the rebellion with irresistible power.

THE CAPTURE OF NEW ORLEANS.

The report of the capture of New Orleans is fully confirmed. The Southern newspapers said at first that the boats of Commodore Farragut's fleet ran by the forts below the city without reducing them, but the Norfolk *Day Book* of May 3d, had the following telegram from Augusta, Georgia:—

The Savannah *News* has a special dispatch from Mobile, of the 1st of May. It says that Forts Jackson and St. Philip had fallen, and Gen. Duncan was in New Orleans on his parole. Also that the federal flag was hoisted on the Custom House.

OPERATIONS NEAR CORINTH.

Corinth is situated at the crossing of two railroads, one extending east and west, and the other north and south. Gen. Halleck, the Commander of the government forces, has been operating to cut off the communications of Beauregard by means of these roads with the surrounding country. On the 30th of April the forces of Gen. Halleck had a skirmish with the rebels at Purdy; drove them through the town, which the Union troops took possession of; burnt two bridges and ran a locomotive into the river. This action cut off all communication between Corinth and the North.

On the third of May, Gen. Paine, was sent from General Pope's division to cut the railroad running east from Corinth, and if there is no mistake in Gen. Pope's dispatch, the one running south also. The following is the official dispatch of Gen. Pope:—

NEAR FARMINGTON, May 3, 1862.

A reconnoissance sent towards Farmington found the enemy, forty-five hundred strong, with four pieces of artillery and some cavalry, occupying a strong position near the town. Our forces advanced at once to the assault, and after a sharp skirmish carried the position in fine style. The enemy left thirty dead on the field, with their tents and baggage. Our cavalry are pursuing them. The whole affair was very handsome, our regiments charging the battery and their line of infantry at the double quick. The enemy fled in wild confusion. Some regiments of cavalry, sent through to Booneville, took possession of the town, tore up the railroad track and destroyed two bridges. We have a good many prisoners, but cannot tell how many yet. Our loss is two killed and twelve wounded. JOHN POPE, Major General.

Booneville is on the railroad running from Corinth south to Mobile. Thomas A. Scott, Assistant Secretary of War, telegraphs that the bridges at Glendale were destroyed. This place is on the road running from Corinth easterly to Charleston, S. C., and if both dispatches are correct, Beauregard has now railroad communication open only to the west, in the direction of Memphis, which is about 100 miles distant. This westerly road is, however, tapped at a distance of 50 miles from Corinth by a road which leads southerly to New Orleans; that city being 399 miles from the junction. Some deserters report that Beauregard is evacuating Corinth and moving westerly—either proceeding to Memphis, or turning southerly towards New Orleans. Other deserters contradict this report. At all events our forces are hemming him in, and he must soon surrender, fight or flee.

SURRENDER OF FORT MACON, N. C.

After a bombardment of eleven hours by two batteries of mortars and one of Parrott's guns, Fort Macon, with its garrison, armament, provisions and stores, was surrendered to Acting Major General Parkes, commanding the Third Division of General Burnside's army, on the 25th of April. The casualties on our side were one killed and twenty wounded.

General Parkes's preparations were all complete on Wednesday night, but the command to open fire was not given until Friday morning at 5½ o'clock, when a shot was fired from one of the 30-pounder Parrott guns. Shells from 10-inch and 8-inch mortar batteries followed, and the firing on our side at once became regular and uninterrupted. The fort replied with its first gun at 6 o'clock, and continued, until its pieces were silenced, to fire by salvos of three or four at a time, until 5 o'clock in the afternoon, when the white flag was hoisted.

The gunboats *Daylight*, *State of Georgia*, *Chippewa* and *Gemsbok* took part in the engagement, sailing in an ellipse, and firing by turn, but the heavy sea which ran prevented their doing any service, and they soon withdrew beyond range. The *Ellis* was also present in Cove Sound, but her single gun was so inefficient that she did not come into action.

Gen. Burnside arrived on Thursday with two armed barges, and witnessed the bombardment.

The fire of our batteries dismounted thirteen guns, and tore up the glacis and rampart in the most effective manner. The highest praise is due to Captain Morris, First Artillery, who commanded the Parrott gun battery; Lieut. D. W. Flagler, Chief Ordnance Officer, who had charge of the 10-inch mortars, and Lieut. Prouty, Twenty-fifth Massachusetts, of the 8-inch battery, for the accuracy of their firing. Of 1,100 shot and shell thrown by them at the fort, 560 struck the work. The guns of the fort were worked with skill and courage, but the sand hills of our position afforded complete protection to the men.

The garrison surrendered as prisoners of war, were released on parole, and were allowed to take their private effects with them. The officers retained their side arms.

The surrender of Fort Macon gives Gen. Burnside a port of entry, with secure anchorage for his heaviest vessels. It gives the government another of its stolen fortifications, with 50 guns, 20,000 pounds of powder, shot and shell in proportion, 400 stand of arms, a large store of provisions, 430 prisoners, and 30 horses; it releases a portion of the blockading fleet for service elsewhere, and insures the retention of this district of North Carolina.

Col. Rodman, of the Fourth Rhode Island, was placed in charge of the fort.

ACTIVITY OF GENERAL MITCHEL.

Gen. Mitchel, with characteristic energy, continues to push his way along the great railroad which traverses the Southern States from Washington to New Orleans, and which he pounced upon in the middle so suddenly, on the 11th of April, as we have related. On the 30th of April he captured Bridgeport, in Alabama, a place on the railroad 68 miles northeast from Huntsville, the town first captured by Gen. Mitchel. Bridgeport is only 27 miles west from Chatanooga, in Georgia, where it has been said by the Southern papers the rebels would make a great stand.

EVACUATION OF YORKTOWN.

During the night of Saturday, May 3d, the enemy behind the intrenchments at Yorktown kept up a wild cannonade upon our camp, the firing continuing till about half-past two o'clock. On Sunday morning, May 4th, just at the first faint light of early dawn, three men were observed approaching our outer pickets with a flag of truce. They were received by Colonel Black. At first it was supposed that they were sent from Yorktown officially—perhaps with a proposition for surrender—but it was soon ascertained that they had come over on their own accouut. They are men who formerly resided in Hampton, the beautiful little village which was situated near the narrowest point of the peninsula, and which the rebels wantonly burned down. These men had been forced into the rebel service, and they expressed their great delight at the event which enabled them to escape from such a distasteful and exacting service. This event was the complete evacuation of Yorktown, which they then announced to us. They belonged to the Thirty-second Virginia regiment, which was one of the last to leave. They said that when our army arrived in front of Yorktown the rebel force under General Magruder was not more than eight thousand men. Their statements confirm the opinion which the movements of the rebels since our arrival have induced some of us to form—that is, that they were actually frightened at our approach. When the brigade which had the honor of our advance marched along the turnpike road and halted in the open field in full view, and not more than a mile and a half from their most formidable works, and when a few batteries of our light artillery wheeled into positions perfectly unprotected from the fire of their heavy guns, and threw a few shells at them, the rebels were terrified at our boldness. The precise language of one of these deserters, and one of the first observations which he made was this, "If you had gone over there that night you could have carried everything." From these and other deserters it is ascertained that the retreat of the rebels was precipitate. They commenced carrying all but their guns back to Williamsburg four days previously. Wagons had been engaged in transporting their ammunition, provisions and camp equipage for nearly a week. Their sick and wounded, numbering over two thousand five hundred, were sent to Richmond ten days before the surrender. The rebel council of war was held in Mrs. Nelson's house at Yorktown, on Tuesday and Wednesday, April 29th and 30th. Jeff. Davis and two members of his Cabinet, Generals Lee, Magruder and nine other generals were present. The debates were warm and exciting; but finally it was resolved to evacuate. The general intrusted with the orders of evacuation kept it a profound secret from the officers and men. Gen. Magruder protested against the decision; swearing that if they could not fight McClellan at Yorktown they could not any where.

When the Union troops advanced a month ago and invested the enemy's position, General Magruder was in command of Yorktown with some seven thousand five hundred or eight thousand men. Our appearance put the rebel General and his Southern supporters into the greatest state of trepidation. Reënforcements were immediately sent for, and they kept arriving until three days since at the rate of sometimes more and sometimes less than five thousand a day, until at one time, only a few days ago, they had about one hundred thousand men along their whole line from right to left, and on the peninsula. These men were kept at work making the fortifications stronger. General Johnston himself and the greater portion of his army were there. Up to within a few days since the rebels intended to give battle. Finding, however, that the heavy projectiles which we had thrown over were so terribly destructive, and having reason to believe that the batteries we were building would, when they should open, soon compel them to surrender, joined with other equally-suggestive circumstances, satisfied the rebel generals that their position would speedily be untenable, and that the best policy for them to pursue was to evacuate.

On learning of the evacuation, Gen. McClellan ordered a pursuit by the cavalry and light artillery, who commenced their march about ten o'clock, and overtook the enemy in the afternoon, when a sharp artillery skirmish took place.

Seventy-one cannon were taken at Yorktown, and a large quantity of ammunition. Gloucester Point, on the opposite bank of York river was evacuated at the same time as Yorktown, and was also taken possession of by our troops. Gunboats were immediately sent up York river, and were followed by transports with troops for West Point, which is at the head of navigation on the York river, and is 37 miles northeast from Richmond, with which it is connected by railroad.

FIGHT AT WILLIAMSBURG.

On Monday, the 5th of May, our advance overtook the rear guard of the enemy, who had turned at bay near Williamsburg, and some fighting took place. The day was rainy, and at about 8 o'clock in the morning a cannonade took place on our left, which lasted some two hours. The enemy made a charge, but were handsomely repulsed. About 5 o'clock in the afternoon, Gen. Hancock's brigade, assisted by Kennedy's and Wheeler's batteries, was ordered to the right to feel the enemy, and, if possible, to turn their left wing. Here they were met by Gen. Early's brigade, consisting of the Fifth North Carolina and Twenty-fourth and Thirty-eighth Virginia regiments with a squadron of cavalry, who advanced in line of battle. Our troops, who were quickly prepared to receive them, opened a heavy fire upon them, and the enemy advanced steadily to within two hundred yards, when Gen. Hancock ordered a chargewith the bayonet, which was executed with the greatest courage. The enemy's line broke—they became panic stricken and fled, leaving their dead and wounded be

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hind. The rebels left upward of 80 dead and 40 wounded. We also took nearly 200 of them prisoners. Among their killed and wounded was the Colonel and Lieutenant Colonel of the Fifth North Carolina regiment.

THE PURSUIT CONTINUED AND WILLIAMSBURG OCCUPIED.

The following dispatch from Gen. McClellan is the latest authentic intelligence we have from his army before going to press :—

HEADQUARTERS ARMY OF THE POTOMAC,
Williamsburg, Va., May 6.

Hon. E. M. STANTON, Secretary of War:—I have the pleasure to announce the occupation of this place as the result of the hard-fought action of yesterday. The effect of Hancock's brilliant engagement yesterday afternoon was to turn the left of their line of works. He was strongly reënforced, and the enemy abandoned the entire position during the night, leaving all his sick and wounded in our hands. His loss yesterday was very severe. We have some 300 uninjured prisoners, and more than 1,000 wounded. Their loss in killed is heavy. The victory is complete. I have sent cavalry in pursuit. The conduct of our men has been excellent, with scarcely an exception. The enemy's works are very extensive and exceedingly strong, both in respect to position and the works themselves. Our loss was heavy in Hooker's division, but very little on other parts of the field. Hancock's success was gained with a loss of not over 20 killed and wounded. The weather is good to-day, but there is great difficulty in getting up food, on account of the roads. Very few wagons have yet come up. Am I authorized to follow the examples of other Generals, and direct the names of battles to be placed on colors of regiments? We have other battles to fight before reaching Richmond.

G. B. MCCLELLAN,
Major General Commanding.

IMPORTANT BATTLE IN NEW MEXICO.

An official dispatch confirms the report that Gen. Canby had obtained a decisive victory over the rebels at Paralta, in New Mexico. The Texan rebels' works had been so invested that after the battle they had but two choices—to surrender or flee to the mountains, where, if they adopted the latter course, they would most assuredly fall into the hands of the Indians.

THE PRIVATEER "SUMTER."

On the 17th of April, Capt. Semmes and other officers of the privateer *Sumter* arrived in England on the steamer *Mooltan*. They left the *Sumter* at Gibralter. The crew had been disbanded, and it was reported that the vessel had been sold, though this was denied by one of the officers.

GEN. BEAUREGARD RE-ENFORCED BY LOVELL.

Gen. Halleck telegraphed to the War Department on the 6th inst. that the rebel army under Gen. Lovell, which evacuated New Orleans on the approach of our troops, had arrived at Corinth.

TENNESSEE RETURNING TO THE UNION.

The Nashville *Union* of the 3d contains a call, signed by one hundred and fifty influential citizens, assigning Monday for a meeting to take measures to restore the former relations of Tennessee with the Federal Union.

CAVALRY FIGHTS IN TENNESSEE.

The rebel marauder Morgan, with a force of about one thousand cavalry, attacked a small body of Union troops at Pulaski, Tennessee, on Friday, May 2, and after a fight of two hours and a half, during which the rebels lost six killed and two wounded, and our troops lost two killed, three wounded and one missing, our whole force was taken prisoners. The prisoners were released on parole and are now in Nashville. The rebels out-numbered our forces four to one. On Monday morning a body of cavalry under Gen. Dumont, found and attacked the united rebel cavalry under Morgan and Wood, at Lebanon, and utterly routed them, after killing a great number, capturing one hundred and fifty prisoners and nearly all their horses and arms. The fight lasted an hour and a half, and the rebels fled, closely pursued by General Dumont.

DEMORALIZATION OF THE REBEL ARMY.

Deserters at all points agree in stating that the soldiers of the Confederate army are exceedingly discouraged by their great and constant reverses. Such statements from such a source are to be received with much caution, but they are partly confirmed by other evidence. We learn by Southern papers that two regiments under Beauregard who had been enlisted for twelve months, refused to serve longer on learning of the law recently passed by the Confederate Congress, requiring all soldiers to continue to serve till the end of the war. A band of 400 Germans, also in Beauregard's army, recently deserted in a body and came over to our lines.

NEWS DIRECT FROM NEW ORLEANS.

Since the preceding matter was in print the steamship *Columbia* has arrived at this port, and by her we have the Cuban *Herald*, extra, containing the particulars of the bombardment of Forts Jackson and St. Phillip, on the Mississippi.

The bomb boat *Daniel Smith* arrived at Havana on the 30th ult., bringing dispatches for the United States government. By her we have the particulars of the bombardment of the forts, which had been carried on for six days with unabated fury. The *Daniel Smith* left the scene of action on the 26th ult.

The chain which was placed across the river was broken by two of the gunboats.

Twenty-one mortar and three gunboats had been engaged in the attack upon the forts, and succeeded on the 25th in silencing the fortifications, and securing the safe passage up the river of fourteen war steamers, which were bound for New Orleans, 80 miles above.

The *Hartford* was set on fire by coming in contact with one of the fire ships, but the fire was extinguished before much damage was done.

The Federal forces had destroyed eleven Confederate gunboats.

The Federal gunboat *Verona* and the Confederate steamer *Webster* had an engagement, and the *Webster* ran into the *Verona*, injuring her so badly that she was in a sinking condition. The *Verona*, while disabled, discharged eight guns into the *Webster*, with such destructive and crushing effect that they both went down together.

The Federal gunboat, *Maria J. Carlton*, was sunk by the guns of the forts.

Gen. Butler had landed 4,000 men above the forts.

On the 25th a flag of truce was sent on board to Commodore Porter, asking what terms would be demanded in the surrender. The reply was "unconditional," and the arrangements for the surrender were to be made on the 27th.

It is said the contest has been a hard one, many of the men on the mortar boats falling at their posts from fatigue, so incessantly had they been kept at work.

The floating battery *Manassas* was sunk by the steamship *Mississippi*.

Fire ships had been sent down the river every night by the rebels, but a force was detailed with small boats to tow them off where they could do no harm.

The loss on the part of the Federals is said to be 114, while that of the enemy is not known.

Four hundred rebel prisoners have been taken.

A New and Simple System of National Taxation.

The subject of taxation and the raising of a large revenue has engaged the attention of some of the most profound and subtile intellects in our country. It is a very difficult question to master. A simple, and comprehensive system of taxation, suitable to the habits and pursuits of our people is desirable. The tax bill which has been maturing by our statesmen in Washington is very complex. The following proposed system of raising a large revenue is original, simple and comprehensive, and it is believed that $1,000,000 per day may be raised by it without being felt as a severe burden by the people.

PRINCIPLE OF THE SYSTEM :—A stamp tax of one per cent on receipts given for all money paid (in sums of five dollars and upward) in all business transactions of purchase and sale of all manner of property, and on all payments of rent, interest and dividends.

REASONS.—1. It will be promptly realized or prepaid. 2. It will save nearly all the cost of collection, thereby adding from fifteen to twenty millions to the available revenue. 3. It will avoid the frequent administration of oaths and its consequent demoralizing effect. 4. It will prevent a large increase of one of our greatest political dangers—Executive patronage—in the appointment of assessors, examiner and collectors. 5. It will not disturb the existing relations of trade and manufactures. 6. It makes unnecessary any adjustment of the tariff, or any consideration of the Reciprocity treaty. 7. Its tendency will be to check mere speculation, and to reduce the number of "middle men," and so save their profits to consumers. 8. It requires no inquisition into private affairs, and so avoids the the danger of bringing the government and its officers into disrepute. The bill now before congress is extremely offensive on this score. 9. The tax on sales by each class of producers or traders will be so small that prices will be gradually and imperceptibly adjusted to the new order—giving this the character of an indirect tax. 10. The tax will be paid principally by a class who, from their habits of business, will understand their liabilities in the matter, and will therefore more promptly comply with the requirements of the law. Being paid only when money is received and by the party receiving, it will be more readily and willingly done than in any other way. 11. It will relieve trade and industry from uncertainty—members of Congress from the annoying importunities of interested parties and the country from the expense of a prolonged, tedious and unsatisfactory legislation. 12. It will be collected on all past transactions that have not been finally settled and paid, and from disloyal as well as loyal people.

Stamps of various amounts should be provided, so as readily to meet the requirements of any transaction, and efficient penalties provided for non-usance, and for the sale thereof at any other than government offices.

The following statement (embracing less than one-third of the transactions occurring), based on census returns and estimates therefrom, shows the amount of revenue derivable from them alone :—

Products of mines and quarries,	$164,000,000	
from which deduct value of the precious metals,	82,000,000	$82,000,000
Product of manufactures		1,700,000,000
Products of agriculture and of the forests,	2,200,000,000	
from which deduct estimated consumption by producers,	1,000,000,000	1,200,000,000
Products of fisheries,		20,000,000
Imports of foreign merchandise,	363,000,000	
to which must be added duties, freights and other cost of importation 33⅓ per cent	121,000,000	484,000,000
		$3,486,000,000
Add for profits on sale 5 per cent,		174,000,000
		$3,660,000,000
This amount sold three times gives total sales		$10,980,000,000
which at 1 per cent will yield a revenue of		$109,800,000

One million per day would quietly fall into the treasury, and the expense of selling hardly increase the cost of selling postage stamps.

The only objection conceivable to this system of taxation, in lieu of proposed bill, would come from a corrupt party happening to be in office, and wishing the influence which 300,000 tax gatherers would give them, to corrupt the people, control elections and retain place and power.

This scheme has been the subject of much careful thought and investigation, and it is proposed to be substituted for the complicated, unequal and annoying scheme of taxation proposed in the bill now before Congress.

UNITED STATES CIRCUIT COURT—NEW JERSEY.

Infringement of Patent—Hat Manufacturers in Court.

Burr vs. Duryee and others—GRIER, D. J.—Three suits brought against the defendants, who were extensive hat manufacturers, in Newark, N. J., by Henry A. Burr. The plaintiff was the owner of a patent originally granted to Henry A. Wells, April 25, 1846, for an improvement in the machinery and process for making fur hat bodies. This patent was re-issued in 1856, extended in 1860, and after the extension was again surrendered and re-issued, and suit was brought on this extended and re-issued patent.

The defendants used several machines, constructed under Letters Patent granted to Seth Boyden, August 30, 1859, and January 10, 1860. The defendants also used two machines under a license from Burr constructed in precise accordance with the Wells patent. The defendants claimed under the license the right to make new machines whenever the old ones were worn out—but the plaintiff insisted that this license, merely authorizing the use of two machines, did not entitle defendant to build. On this point the Court decided that as the invention was one in which the value of the monopoly consisted in the use of the machine and not in the sale of the machine, that the license to use two machines implied the right to build the two machines and when worn out to replace them by others. The Court also decided that the fact that the defendant was a licensee as to two machines did not prevent him from using other hat body machines and setting up every defence as to those other machines which a non-licensee might.

The Court held that the Boyden Machine did not infringe the Wells patent as re-issued. That any construction of the Wells patent which would make the Boyden Machine an infringement, would also make the Wells patent void for claiming too much. The Judge was very severe in his criticism on the extent to which re-issues are carried of late.

The defendants were also charged with infringing the patent granted to A B. Taylor, March 18, 1856, re-issued Aug. 25, 1860—and with infringing the patent granted to Lansing E. Hopkins, December 21, 1852.

The Court decided that the Boyden Machine did not infringe either of these patents.

The cases were argued by Messrs. Gifford & Bradley with whom were Keller & Dickerson for plaintiff, and by George Harding and Cortlandt Parker for defendants. The bills were dismissed with costs in each case.

THE veteran arctic voyager, Sir James C. Ross, recently died in England, aged 72.

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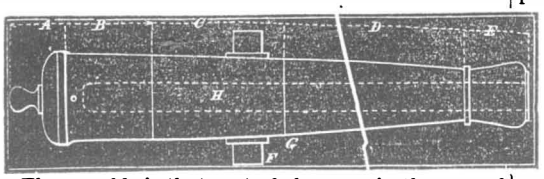
ORDNANCE AND GUNNERY.

D. Van Nostrand, No. 192 Broadway, has just published a new edition of Capt. Benton's work on ordnance. It is entitled "A Course of Instruction in Ordnance and Gunnery; Compiled for the use of the Cadets of the United States Military Academy, by Capt. J. G. Benton, Ordnance Department, late Instructor of Ordnance and Science of Gunnery, Military Academy, West Point, Principal Assistant to the Chief of Ordnance, U. S. A." It is a comprehensive and elaborate treatise on the subject, under the following heads: "Gunpowder," "Projectiles," "Cannon," "Artillery Carriages," "Machines and Implements," "Small Arms," "Pyrotechny," "Science of Gunnery," "Loading, Pointing and Discharging Firearms," "Different Kinds of Fires," "Effects of Projectiles," "Employment of Artillery," "Tables of Multipliers," "Tables of Fire," "Appendix, "Index." We make the following extracts :—

NAMES OF THE SEVERAL PARTS OF A CANNON.

This nomenclature refers more particularly to guns of the old pattern, large numbers of which will probably remain in service for some time to come. The most recent models are characterized by an entire absence of moldings and ornaments, and the elements, in both cases, are curved instead of right lines. The modifications which it is necessary to make to suit the present nomenclature to the new system, will readily suggest themselves to the mind of the pupil.

The names applied to the several parts of a cannon are illustrated in this cut. A is the cascable; B, first reinforce; C, second reinforce; D, chase; E, swell of the muzzle; F, trunnions; G, rimbases; H, bore.



The cascable is that part of the gun in the rear of the base of the breech; it is composed generally of the following parts: the knob, the neck, the fillet.

The base of the breech is a frustum of a cone, or a spherical segment, in rear of the breech.

The base ring is a projecting band of metal adjoining the base of the breech, and connected with the body of the gun by a concave molding. It serves as a point of support for the breech sight, and rests upon the head of the elevating screw. The ring is omitted in guns of recent model.

The breech is the mass of solid metal behind the bottom of the bore, extending to the rear of the base ring.

The reinforce is the thickest part of the body of the piece, in front of the base ring. If there be more than one reinforce, that which is next to the base ring is called the first reinforce; the other, the second reinforce.

The chase is the conical part of the piece in front of the reinforce.

The astragal and fillets in field guns, and the chase ring in other pieces, are the moldings at the front end of the chase.

The neck is the smallest part of the piece, in front of the astragal or chase ring.

The swell of the muzzle is the largest part of the piece in front of the neck. It is terminated by the muzzle moldings, which, in field and siege guns, consist of the lip and fillet. In sea-coast guns, and heavy howitzer and columbiads, there is no fillet. In field and siesge howitzers, and in mortars, a muzzle band takes the place of the swell of the muzzle.

The face of the piece is the terminating plane perpendicular to the axis of the bore.

The trunnions are cylinders, the axes of which are in a plane perpendicular to the axis of the bore, both axes being in the same plane.

The rimbases are short cylinders, uniting the trunnions with the body of the gun. The ends of the rimbases, or the shoulders of the trunnions, are planes perpendicular to the axis of the trunnions.

The bore of the piece includes all that part bored out, viz.: the cylinder, the chamber (if there be one), and the conical or spherical surface connecting them.

The muzzle or mouth of the bore is chamfered, in order to prevent abrasion and facilitate loading.

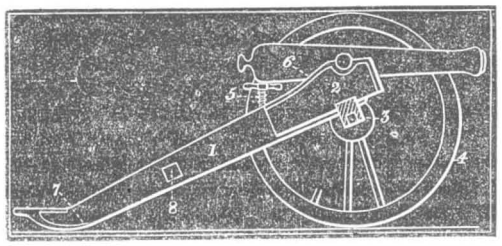
The lockpiece is a block of metal at the outer opening of the vent for the attachment of the lock. As friction tubes are now used for firing cannon in the land service, this part is omitted.

The natural line of sight is a line drawn, in a vertical plane through the axis of the piece, from the highest point of the base ring to the highest point of the swell of the muzzle, or to the top of the sight, if there be one.

The natural angle of sight is the angle which the natural line of sight makes with the axis of the piece.

GUN CARRIAGES.

Artillery carriages, like the cannon which they support, are classified into field, mountain, prairie, siege and sea-coast carriages. The sea-coast carriages not being required for the transportation of their pieces, differ materially from the others in their construction. The principal parts of all other artillery carriages are, as shown by the following figure, the stock, 1, the



cheeks, 2, the axletree, 3, the wheels, 4, and the elevating screw, 5.

CAISSONS.

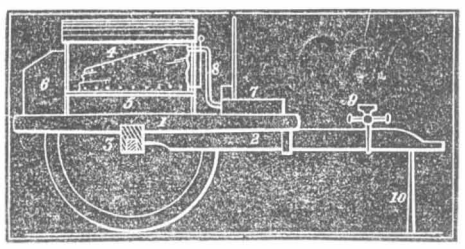
The caisson is used to transport ammunition; and in light field batteries there is one caisson to each piece, in heavy batteries there are two. The ammunition is contained in three chests—two mounted on the body and one on the limber. The number of rounds for each chest varies with the caliber o the piece, as follows, viz.:—

6-pounder gun and 3-inch rifle gun	50
12-pounder gun	32
12-pounder howitzer	39
24-pounder howitzer	23
32-pounder howitzer	15

The whole number of rounds for each piece may be ascertained by multiplying the above numbers by four.

TRAVELING FORGE.

The traveling forge is a complete blacksmith's establishment, which accompanies the battery for the purposes of making repairs and shoeing horses. It consists of a body, upon which is constructed the bellows house, &c., and the limber, which supports the stock in transportation. The body (see the following figure) is composed of two rails, 1, a stock, 2, and an axletree, 3. The bellows house is divided into the bellows room, 4, and the iron room, 5. Attached to the back of the house is the coal box, 6, and in front



of it is the fireplace, 7. From the upper and front part of the bellows, an air pipe, 8, proceeds in a downward direction to the airbox, which is placed behind the fireplace. The vise, 9, is permanently attached to the stock, and the anvil, when in use, is supported on a stone or log of wood, and when transported is carried on the hearth of the fireplace. The remaining tools are carried in the limber chest. When in working order, the point of the stock is supported by a prop.

CHARGE.

Maximum Charge.—By increasing the charge of powder of a firearm the greater and (in consequence of the wedging of the unburned grains among each other) the more difficult will be the mass to be set in motion; the space between the front of the charge and the muzzle will be diminished, and a large number of grains will be thrown out unconsumed. It is evident, therefore, that the effect of a charge of powder on a projectile should not increase with the size of the charge, and experiment shows that beyond a certain point an increase of charge is actually accompanied with a loss of velocity. The charge corresponding to this point is called the maximum charge.

The following are the results of experiments made in France on a 36-pounder gun, of 16 calibers in length :—

Charge, lbs.	36,	42,	49,	56,	70,	77.
Initial velocity, feet.	1,320,	1,170,	950,	493,	454,	191.

It will, therefore, be seen that an excess of charge is almost as injurious to the velocity of a projectile, as an excess of length of bore.

Effects on Recoil.—Trials made at Turin show that the recoil, and consequently the strain on the gun and carriage, increase in a more rapid ratio than the charges, viz.: 14 lbs. of powder gave a recoil of 70 inches; 15 lbs., 72 inches; 16 lbs., 74 inches; 18 lbs., 100 inches.

Effects of Length of Bore on Maximum Charge.—All experience proves that the longer a piece is, in terms of its caliber, the greater will be the maximum charge in proportion to the weight of the projectile. For heavy cannon, 19 to 20 calibers long, the maximum charge may be stated to be one-half the weight of the projectile; and for light cannon of the same length, one-half to two-thirds of this weight—the increase of range for charges above one-half the weight of the projectile being very small.

Most Suitable Charge.—A charge of one-fourth ths weight of the projectile, and a bore of 18 calibers, is the most favorable combination that can be made in smooth-bored cannon, to obtain the greatest range with the least strain to the carriage.

In the early days of artillery, when dust instead of grained powder was used in cannon, the weight of the charge was equal to that of the projectile; after the introduction of grained powder it was reduced to two-thirds, and in 1740 to one-half this weight.

[The work from which these extracts are compiled embraces 550 pages of reading matter, and is profusely illustrated. The typography is faultless, and the paper and binding superb, reflecting much credit upon the publisher.—Eds.]

Increase of Insects.

John H. Klippart, in a communication to the *Ohio Farmer*, speaking of the increase of insects, says :—

It is a well-known fact in natural history that there is such a thing as alternate generations; and it is an equally well-known fact to entomologists that there are viviparous and oviparous generations of the same insect during the same year. May not the first generation of the army worm be oviparous, and the succeeding generation be viviparous, as in the following case of aphides? All the aphides, it has been well ascertained, which appear in the spring, are exclusively females, no males being found till the autumn; and these females are endowed with a fecundity almost incredible. M. Latreille says that one female during the summer months will produce about 25 a day, and M. Reaumur calculates that one aphis may be the progenitor of 5,904,900,000 descendants. It is not necessary for the young female aphides produced during the summer to pair with a male, which, indeed, would be impossible, as no males were then to be found; yet these females go on producing, each their 25 a day of living young ones, all of which become in a short time as fertile as their parent. The following calculation of the fecundity of a species of aphides, from Prof. Owen's lectures on "Comparative Anatomy," will afford some explanation of the extraordinary number in which these creatures sometimes occur; the *aphis lanigera* produces each year ten viviparous broods, and one which is oviparous, and each generation averages 100 individuals.

Generation.	*Aphis produces.*
1st	1
2d	100
3d	10,000
4th	1,000,000
5th	100,000,000
6th	10,000,000,000
7th	1,000,000,000,000
8th	100,000,000,000,000
9th	10,000,000,000,000,000
10th	1,000,000,000,000,000,000

This fearful table, representing the fecundity of one species of insects, affords a most useful lesson at this season of the year. Now is the period to labor with most success in their destruction. Every insect observed upon the stem or leaf of a plant should be brushed off and destroyed.

The Suez canal approaches completion; 22,000 workmen are employed on the work.

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THE COLORS OF COAL TAR.

Number II.

The art of dyeing various colors with one principal coloring substance and different reagents, has long been known and practiced in all countries. Thus with cochineal and lac insects, scarlet, red, purple and lilac colors can be dyed by using different reagents, principally metallic salts such as the bichloride of tin, oxides of iron, &c. With madder—a vegetable substance—red, purple, and lilac colors are also dyed by employing such reagents as alum and the acetate of iron. Applying the same well known principles of color chemistry to aniline colors great success has already been obtained. It is indeed one of the most remarkable facts connected with modern chemistry, that, although it is but a very few years since colors have been produced from the products of coal tar, a far greater variety has already been obtained than from any other chief coloring agent. Thus from Perkin's aniline purple, described in our last article on this subject, a blue dye can be made by boiling the insoluble purple for some time in hydrochloric acid diluted at the rate of 10 parts of commercial acid to 100 parts of water.

Aniline Red Dyes.—The beautiful crimson color now called *magenta*, was produced by Dr. Hoffman in September, 1858, and an account of it was then transmitted to the Academy of Sciences. He called it carbo-triphenyl-triamine, a crystalline base formed by the condensation of three molecules of aniline reunited by carbon substituted for hydrogen. It was M. Verguin, of France, however, who first produced this beautiful color in merchantable quantities for dyers, and his mode of preparation was first patented in Europe April, 1859, by MM. Reynard Brothers, in Lyons, France. It is usually prepared as follows :—Into a glazed iron pan 100 parts of aniline and 60 of anhydrous bichloride of tin are placed, and the whole heated to about 392° for about twenty minutes. This produces a dark liquid, which becomes thick and glutinous when it cools. It is then mixed with boiling water and filtered, and to this filtrate is added common salt which precipitates the color called fuchsine. M. Joseph Renard obtained an American patent July 31, 1860, from which the following is an extract :—The preparation of the coloring matter referred to is based upon the discovery that if aniline be heated to a temperature of from 380° to 400° Fah., together with several anhydrous or desiccated compounds, the mixture thus produced will be changed into a substance of such dark color that it appears to be almost black, but which, when applied in layers or diluted, is transparent and of a beautiful red color. The substances or chemical compounds by the treatment of which aniline produces the red coloring matter are quite numerous, but may be classified under the following groups :—

Sulphates of peroxide of iron.
Nitrates of protoxide of mercury.
Chlorates of protoxide of tin.
Bromates of binoxide of mercury.
Iodates of binoxide of tin.

All ferric, mercuric, stannic and uranic compounds, the yellow oxide of uranum, the oxide, chloride, bromide, iodide and fluoride of silver. Many of these compounds being too rare or expensive for practical purposes, M. Renard therefore confines himself to the use of the following :—

Bichloride of tin.
Bichloride of Mercury.
Protosulphate of mercury.
Photonitrate of mercury.
Deutonitrate of mercury.
Sulphate of tin.
Nitrate of peroxide of iron.

The following is the claim of the patent :—

I claim combining with aniline the metallic salts specified, or their equivalents, and treating the same in such a manner as to produce a red in contradistinction to a purple or bluish coloring matter or dye.

Magenta has also been made with the permanganate of potash and the binoxide of lead, and with arsenic acid, as described by Dr. Crace Calvert. Two parts of aniline and one of arsenic acid are heated to about 250°, and when the color becomes red boiling water is added, and the product allowed to cool; common salt is then added, which precipitates the coloring matter, and this is then washed and dissolved in methylated alcohol. This substance is a powerful organic base slightly soluble in water. When solid it is a brittle mass having a beautiful green metallic luster.

Commercial purple and red aniline colors differ in their composition as follows :—Purple, $C_{36}H_{17}N_3O_2$. Red, $C_{36}H_{20}F_4O_4$. The fuchsine, red, dissolves in ammonia and in sulphuric acid, and is discolored with the acid, but the purple is unaffected with these reagents. Silk and wool are dyed with fuchsine by simply adding some of the color to a slightly acidulated bath of water. Its dyeing power is so great that ten grains of it will color two square yards of silk. This beautiful red color of aniline has been called azeleine fuchsine, roseine, magenta, &c. Dr. Hoffman proposed the appropriate name rosaniline for it, as magenta and solferino are flash terms which should be repudiated.

Dying Cordovans.

The following extracts on this subject are taken from the *Shoe and Leather Reporter* :—

Cordovan leather, which takes its name from the city of Cordova, in Spain, and of which the original preparation is attributed to the Moors, is plain, but handsome, with a fine grain, and similar to the morocco, which is ordinarily tanned with oak bark, nut galls, or sumac. The best kinds, especially the yellow cordovans, are brought from the Levant; those of Spain, France and Hungary are also highly esteemed, and in Germany the cities of Dantzic, Lubec and Leipzig, enjoy a reputation for like productions. The material used in the manufacture comprises goat skins (both male and female), dog skins, and even hog skins ; they are produced every color and quality, but those made of he-goat skins are the best.

The skins, after having been cleaned and stretched in water, are placed in lime pits ; they are the replaced in water for a space of from eight to fifteen days, care being taken to renew it from time to time, and to work the skins by treading upon them with the feet. After a lapse of a fortnight a bath is applied composed of water and the excrements of dogs ; the temperature not being higher than that of new-drawn milk ; then a second bath, equally composed of water and of wheat bran. Immediately on being taken from the bath the skins are stretched, pressed between two boards, and rubbed with kitchen salt. Then they are immersed in a third bath, prepared of figs and water. Only skins which it is intended to color black are dyed after having been tanned. Black leather is tanned in liquor of the extract of oak bark ; that of lighter color must be placed in an ooze made up of water and the extracts of sumac and nut galls.

When the operation of tanning is completed, the leather should be withdrawn, taking with it as little moisture as possible, and spread in the shade, where care should be taken to rub on the bloom with Sesam oil, before the sides can become perfectly dry. After the oil is laid on, the process of drying in the shade may be completed and the skin may be folded on the flesh side. When it is desired to give to the cordovan a rough aspect, the surface may be rubbed up with a dull knife, immediately after spreading.

In many parts of Southern Russia, particularly at Karasubazar, a city of the Crimea, of which the cordovan manufacturers enjoy a high reputation, wormwood (*artimisia amma*) is employed to make fast the colors in the leather. If, for example, it is proposed to dye the leather black, a decoction of wormwood is mixed with pulverized cochineal, and then alum is added.

In the Isle of Cyprus, cordovans are dyed red in the following manner :—The skins, generally about fifty at a time, are placed in a fig bath ; they are then passed into a strong solution of alum heated to a temperature equivalent to that of fresh milk ; they are afterward strung upon poles to drip, and at length stretched, in order to expel as much of the dampness as possible ; finally the skins are extended on a table, and after being uniformly stretched the red color is applied with a cotton rag. The coloring matter is prepared by taking ground cochineal and boiling it in soft water in a well-tinned kettle, and during the ebullition five ounces of powdered alum are added for every five ounces of cochineal and the liquor boiled until it has been reduced one-sixth or one-eighth by evaporation, when it is passed through a filter. The skins are coated four or five times with this preparation, and after being placed in the tanning liquor are submitted to the operation of dressing.

In Hungary and in Transylvania, where the manufacturers of cordovans produce goods which are highly esteemed for their quality, the red color is laid on in a different manner. When the skins have been properly prepared for the process, they are fastened together by couples in the form of bags, care being always taken to place the sides to be colored within and facing each other, and to leave but one opening. Into this opening the warm coloring matter is poured. The mouth of the bag is then tied, and if the color does not readily penetrate all parts of the skins and unite with them, they are agitated or rolled around.

New Atlantic Telegraph.

A few everings since Mr. Cyrus W. Field gave a short address on the Atlantic Telegraph before the Geographical Society. He claimed that a cable could now be laid down which would avoid all the difficulties that had been fatal to the first. He said that of more than 6,000 miles of wire manufactured and laid down by the Messrs. Glass, Elliott & Co., less than one per cent was now in actual operation. This Company was ready to make and lay down a cable at the bare cost of material and labor, taking their pay for interest on capital and for superintendence in stock after the cable is tested. The wire which they proposed to make had 510 pounds of copper per mile to 93 pounds per mile in the old cable. The conductors were better insulated and protected than before. They had 13 strands of 3 wires each coated with gutta percha, while the 18 wires of the exterior protection of the the old cable were not coated at all. The new cable had double the strength of the old, and at the same time was lighter in the water, a very important matter, as even if broken it could be recovered, as had been done in the Mediterranean.

Mr. Field alluded to the Behring's Straits route, 18,000 miles to London, and the route by way of Iceland and Greenland. Were all laid, he thought there would be business enough for them all. But it was the opinion of Dr. Hayes that no cable could last near Greenland, on account of the ice grinding the bottom of the sea. The difficulties of length of circuit had been overcome, if they were not disposed of by the successful working of the first cable. Could the money be raised soon, the cable could be manufactured so as to be laid down in the summer of 1863. In answer to a question, Mr. Field stated that the two governments had agreed that neither should interfere with the working of the cable. Last December the English government negotiated with manufacturers in regard to a cable, and found that they could have one laid down in July. In case of war the British government would lay down a cable as soon as possible.

[The non-interference with the telegraph by the two governments, here alluded to, amounts almost to a laughable joke. In time of war England would certainly not interfere with the cable. Having both ends under her control she would encourage its operations as much as possible. The government of the United States under such circumstances could not possibly get the slightest benefit from it. In case of war between the two nations all civil and business intercourse would cease, and Uncle Sam would be compelled to give up his right to the use of the cable. —Eds.

Shot for the Big Guns.

Arrangements are being made, says the Pittsburg *Chronicle*, to put the two immense guns at Fortress Monroe—the Rodman, 15-inch smooth bore, and the *Union* 12-inch rifled—in a condition for offensive operations. Rifled projectiles are being made for the *Union*, and huge solid shot for the 15-inch gun, at the Fort Pitt Works. The ball is not exactly solid, but is so cast as to secure even greater strength than if made solid ; the core being but four inches in diameter. This opening is filled with lead, the ball when complete weighing 430 pounds. These balls are not made of the common metal used in other shot and shell, but of the very best quality of gun iron—Bloomfield at that—almost as hard as chilled iron, and nearly as tough as wrought iron.

It is expected that 1,500,000 bales of cotton, 400 pounds each, will be shipped to England from India this year.

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Correspondence

Manufacture of Wrought Iron.

Messrs. Editors :—In your paper of the 3d instant your correspondent "Monitor" has propounded some questions that I take pleasure in answering, and, at the same time, correcting the erroneous impressions held by himself and other parties concerning my invention.

I am well aware of the efforts of Harvey, Salter, Renton and others, to make wrought iron directly from the ore; they have failed, and I have succeeded, and it is natural for "Monitor" and others to inquire the reason.

Iron ores in a pulverized state have been mixed with carbon and exposed to heat under two conditions; the first, where the flame from a furnace has been brought directly in contact with the ore, and more or less atmosphere has been present, as in Harvey and Salter's experiments; the second, where the ore and carbon have been confined and stationary in a heated vessel as in Renton's.

In Harvey and Salter's experiment the presence of oxygen defeated the end sought; in Renton's, the mass of iron and carbon required such a high heat to operate throughout the ore, that the vessel containing the same was speedily destroyed.

My apparatus overcomes both difficulties by entirely excluding the air, and so agitating a thin layer of the ore and carbon that the deoxidation is accomplished at a comparatively low temperature and the apparatus is not destroyed.

As an example of the durability of my apparatus, I remark that I have used one cylinder for about three months, and treated therewith ore that produced more than one hundred and fifty tuns of iron, and the cylinder appears to be as good as when put up.

I have also a second cylinder in operation, and the two are capable of making four tuns of iron per day, and I find practically that less than two tuns of coal is required for making one tun of blooms.

All the iron I have been able to manufacture has been taken by R. A. Douglass, of the Rockaway rolling mill; and he has a contract for all I can make for three months to come. Besides this, five furnaces are being constructed on my plan by Mr. Douglass.

I am now manufacturing wrought iron directly from the magnetic iron ore. I have also thoroughly tested the hematite and Cornwall ores of Pennsylvania, and with very satisfactory results.

There is a general misapprehension as to the amount of heat required in the deoxidizing process. It will not answer to use so much heat as to burn the carbon. I only employ a dull red heat scarcely visible, and not sufficient to ignite the carbon within the cylinder.

This invention is in regular daily operation at Newark, where I shall be happy to show the same to "Monitor" or any other person interested in the iron manufacture. Isaac Rogers.

New York, May 5, 1862.

The American Mode of Raising Flax.

Messrs. Editors :—When cotton is so high in price and the enemy seem intent on burning what they have, rather than allow it to fall into our hands, I trust farmers generally will see the importance of attending to the cultivation of flax. There is no doubt that there will be a good demand for the fiber, and at highly remunerative rates, but, even if the fiber was worthless, at present rates the seed alone would be a good-paying crop. I was in hopes that the several articles which had appeared in the Scientific American would have been the means of drawing out the views of some of our successful flax growers; but as they don't speak out I would wish to offer a few remarks.

It is well to know how the Irish and Dutch cultivate flax, but more important to know how it is done here. Many rules given for Ireland, instead of stimulating our farmers, might alone be the means of deterring them from embarking in the business. The *Irish Agricultural Review*, from which you quote, observes :—"Unless under very careful management, flax is a most precarious crop, and while on the one hand it may be the most valuable which the farmers can raise, on the other it may be the most worthless;" and Mr. McCudden says that when the plants are six or eight inches high they should be weeded by hand. The advice to a Western man to weed by hand would be equivalent to telling him not to sow flax. Flax, like all other crops, will give the best returns with the best cultivation, but in this section, where large quantities of flax are raised every year, and is found to be profitable, not one acre in a hundred is weeded by hand, and if one may judge from the price paid for the use of the land (from twelve to twenty dollars per acre) it is not considered a very precarious crop.

Again, the authorities already quoted from recommend too thick seeding, viz., seven to nine pecks per acre. In this section, from a bushel to a bushel and a quarter has been proved, by experience, to give the best results, both as regards seed and fiber. Even Irishmen, flax growers in Ireland, have, after coming here, abandoned the thick sowing as not being so profitable as the thin.

It would be well if farmers in different sections would make some careful experiments, and in the fall send you full details, of which you might publish a condensed report, stating description of soil, manner of cultivation, quantity of seed sown, and, on the same soil the difference in results from thin and thick sowing, other circumstances being equal. Water retting in Europe gives the best quality, but for the uninitiated dew retting is the safest, and in this section is the only system practiced, except, it may be, a little water retted now and then as an experiment. Water retting will give decidedly the best quality of fiber, but as great skill and experience is necessary to be successful the better way would be to adopt the dew-retting system, as being the most profitable, at first, and make experiments in water retting on a small scale. George Anderson.

Lansingburgh, N. Y., April 29, 1862.

Cost of Water and Steam Power.

Messrs. Editors :—In the Scientific American of 15th of February last, under the head of "Comparative Economy of Steam and Water Power," your Wisconsin correspondent gets a smart story but no answer.

In England it is considered that the cost of steam is £30 per horse power, and the cost of water power generally £3, or one-tenth. In Glasgow it is found that the cost of each horse power by steam is £36 annually. The cost water power in Greenock (22 miles on the Clyde below Glasgow), including water rent to Shaw's Water Company, interest on wheel, &c., is £5 6s 5d, or £30 13s 7d less than the cost of one horse power by steam at Glasgow. In both places the people pride themselves on working economically.

It is gratifying to see that the Scientific American still maintains permanently the first place in mechanical science, although to quiet folks the great number of articles connected with destruction and war is not very pleasing or interesting. Let us hope, however, that the time is near at hand when inventors' intellects will run in another channel, and the ax, the plow and the anvil supersede the rifle, the sword and the shell. W. K.

Bristol, C. E., April 8, 1862.

[Our correspondent has furnished us with statistics of the cost of steam and water power in two places separated about 20 miles from one another in Scotland. We rather think he does not understand the gist of the story to which he refers, because the cost of steam and water power, as given by him, cannot be taken as a standard for other places. We are of the opinion that his estimated cost of steam power in Glasgow is too high, because the cotton manufacturers of that city, who use steam power, compete successfully with those who use water power in Neilstown, only about nine miles distant.—Eds.

Instrument for Calculating Distances.

Messrs. Editors :—In reading the accounts of battles where artillery is used, I see that it takes the artillerists quite a while to get the range of their guns, as they cannot calculate the distance between the gun and the object fired at exactly. Now, I thought that if an instrumant could be made to calculate the distance to a foot, it would save ammunition and time. So I have gone to work and have succeeded in making an instrument with which I can calculate the distance, anywhere from a foot to as far as I can see, and as quick as I can get the focus on an object with a telescope.

Now, sir, if you think this invention will be of any use to the government please let me know, and also who is the proper person to show it to. If you would like I will send you a diagram of it.

E. Gaylord.

East Winsted, Conn., April 26, 1862.

[Several instruments have been invented for this purpose, but from the fact that none of them have come into general use we infer that they are all defective. There can be no question of the value of one that should be unobjectionable.—Eds.

Adornment of Country School Grounds.

Messrs. Editors :—I desire to solicit attention through the columns of the Scientific American to what I consider an improvement, which, if carried out, is calculated to produce beneficial effects on our rural youth—I mean tasteful surroundings for our country school houses. If some benevolent millionaire would turn his thoughts in this direction I think a plan might be devised to insure good and lasting results.

The surroundings of our district schools are generally of the most forlorn character. Every farmer is anxious to keep a school as far away as possible from his own orchards. School grounds are usually bleak, exposed situations, entirely devoid of taste or cultivation. In my opinion they should be made to conduce to the mental and moral elevation of the scholars.

To accomplish this, at little expense, I think it will only be necessary for the trustees to surround the building with an inclosure, as large as could be compassed, and make it a part of the teacher's duty to lay it out in plats—the male portion to cultivate garden vegetables of different kinds, each boy his allotted bed, and the girls to care for the various flowers and shrubs in their different allotments. Simple botanical instruction might also be given. The chemistry of agriculture might be taught, and in lieu of spending their interludes in romping and making mud pies, the digging and hoeing would furnish ample exercise, and in after life would be a source of gratification and profit.

The advantage of such instruction to the girls would be still more apparent than to the boys, by encouraging a taste for the beautiful in the arrangement of flower beds and bouquets, and thus improve the female character. I think no educational system, especially in the rural districts, can be called efficient without coupling the study of garden and floral productions in their practical operations. Delta.

Substitute for Biting Cartridges.

Messrs. Editors :—Cartridges may be made in a simple manner, which do not require to be first opened. Let each be formed with a small hole in the center of the bottom and thus cover this or the whole rear end of the cartridge with a paste made of pulverized gun powder and a thin cement of shellac dissolved in alcohol. I have used such cartridges for a Colt's pistol, and never had one that missed fire.

Yours, G. L. W.

Washington, D. C.

American and English Patent Dress for Millstones.

The London *Engineer* of April 11th contains an illustration of what it calls "improvements in setting millstones by A. B. Childs, of New Oxford street." This millstone dress is the same exactly as that illustrated on page 328, Vol. XIII. (old series) of the Scientific American, for which a patent was granted to Gabriel Natcher, of Indianapolis, Ind., April 27, 1858. Upon the same day he also obtained a patent for the tool (a diamond) for putting his dress upon the stone. Both the diamond tool and the dress of the stone figure in the *Engineer* as improvements invented by Mr. Childs, who appears to be "no child" in the appropriation and application of other people's improvements.

A Total Eclipse.—The "Confederate Almanac," for 1862, published by Rev. Dr. Sumners, at the Southern Methodist Publishing House, announces an "eclipse of the sun visible over the Confederate States!" To this the Nashville *Union* adds, that about the same time "there will be a total eclipse of the Confederate States, visible over all creation."

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THE DISCOVERIES OF 1861.

[Further Extracts from Wells's Annual of Scientific Discoveries.]

ORIGIN OF THE WESTERN PRAIRIES.

M. Leo Lesquereux, the well-known geologist, who has carefully studied the prairies of the Mississippi valley, ascribes their general formation to the agency of water. He says :

All the prairies still in a state of formation along the great lakes of the north are nothing else but marshes slowly passing to dry land by slow recession of water. When land is continually covered by low stagnant water, its only vegetation is that of the rushes and of the sedges. When the same land is alternately subjected to long inundations and then to dryness, during some months of the year, the same plants continue to cover it. By their decomposition these marshy plants produce a peculiar ground, either black, light, permeable when it is mixed with sand, as it is near the borders of the lakes, or hard, cold, impermeable when it is mixed with clay or muddy alluvium, as in some marshes underlaid by clay or shales, or along the banks of some rivers. Land continually covered with stagnant water cannot produce any trees, because the trees require for their growth, like most of the terrestrial plants, the introduction of atmospheric air to their roots. Neither do trees germinate and grow on a ground alternately covered with stagnant water and exposed to dryness for some months of the year. From these considerations, the law of the general formation of the prairies can be deduced : While a land or a part of a country is slowly passing from the state of swamp or marsh to the state of dry land, the annual alternation of stagnant water and dryness causes the vegetation of peculiar plants, which, by their decomposition, form a peculiar soil unfavorable to the growth of the trees. From this general rule of formation, which regards only the prairies of the Mississippi valley, all the different phenomena or peculiar appearances of the prairies can be easily explained.

TO CHECK THE WARPING OF PLANKS.

The face of the planks should be cut in the direction which lay from east to west as the tree stood. If this be done the planks will warp much less than in the opposite direction. The strongest side of a piece of timber is that which in its natural position faced the north.—*Dingler's Polytech. Journal.*

SKELETON LEAVES.

Mr. Edward Parish, of Philadelphia, the well-known pharmaceutist, publishes the following account of the process of producing the permanent and beautifully white preparations of the frame-work or skeleton of different vegetable structures, known as "skeletonizing." It consists in promoting the decomposition of the cellular structure of leaves, and other parts of plants, without breaking or injuring their woody fiber, and is accomplished very easily and cheaply by macerating them in water. For convenience of illustration, let us select the seed-vessels or burs of stramonium or Jamestown weed, which are in the right condition when partially open, but not at all, or very slightly, when dried or faded in color. Place these in a basin or bucket, and pour on them sufficient hot water to cover them completely, and set them aside. (Cold water will answer the purpose, but not so quickly.) After about three weeks, during which time a little fresh water may be occasionally added, these will be softened, and ready for the removal of the cellular portions. This is so accomplished by scrubbing with an old tooth-brush or shaving brush, allowing a stream of water to run over them during the process; the seeds are to be taken out, and the water allowed to run through the bur, but without removing the internal structure in which the seeds are deposited. In this way a perfect skeleton may be produced, showing all the woody portions, including the external prickles, and when bleached having the appearance of delicately carved ivory.

A variety of seed-vessels may be prepared in this way, of which the dried poppy-head is one of the prettiest. The internal membranous portion containing the seeds requires to be removed, after the requisite maceration in water, by a small opening in the side. An offensive odor, arising from the decomposition of the cellular structure and its contents, is one of the discomforts of this process, but it is amply repaid by the beautiful resulting skeletons. In English "bouquets" of these preparations, there are some seed-vessels not often met with in this country, of which the henbane (hyosciamus) is beautiful.

The preparation of leaves affords a greater variety of forms than of any other portion of the plant.—Only the leaves of trees and shrubs, as far as I know, will furnish a skeleton ; those of annual and herbaceous plants seem to lose their structure entirely by maceration. Some of the more transparent and delicate leaves and ferns may be bleached by being put into the bleaching solution without previous maceration, but must always be previously faded. Among the best leaves for skeletonizing are those of the ivy, the linden, the elm, the poplar, the holly, the pear tree, the chestnut, the sassafras, the magnolia, the althea, and no doubt hundreds that have never been tried ; the oak would furnish a beautiful skeleton, but requires from eight to twelve months' maceration, while most of the others named are sufficiently decayed in from one to three months. The leaves should be free from insect bites or other imperfections ; in cleaning them, it is best to lay them upon a smooth board, turning them over, from time to time, and very carefully removing the decayed parts with a soft brush. It has been observed that ivy leaves are best prepared, after maceration, by tearing off the two outer layers of skin, leaving little else but the skeleton, which is then easily cleaned by careful handling under water. After obtaining the skeletons, the next step is to bleach them ; this is done by placing them, for a term varying from an hour to a whole day, in a solution of chloride of lime, made by dissolving about two ounces in a pint of water.—Poppy-heads or Jamestown burs will bear double that strength ; some delicate leaves, hydrangea flowers, &c., will bleach advantageously with a still weaker solution. The preparation is to be removed from the bleaching liquid as soon as it is thoroughly and satisfactorily bleached ; it is then to be washed, dried, and put away in a box, excluded from the light, till the collection is ready for mounting. This operation requires much skill and taste ; a common way is to make a kind of pincushion into which the bleached stems or petioles, or covered wires glued to the base of the leaves and seed-vessels, are to be stuck ; the whole may then be covered by a glass shade, which protects "the bouquet" from the dust, and renders it an exceedingly attractive household ornament.

PHYSIOLOGY OF WIDOWHOOD.

A correspondent of the London *Medical Times and Gazette* thus writes in relation to the above subject :—

For some time past my attention has been attracted to a very curious form of hereditary transmission of physical peculiarities, which I think worth while to lay before the profession, that more extensive and more accurate investigation than I can accord it may, if not exactly, at least proximately, determine its value, as an influence in the production of disease.

Lord Morton bred a hybrid from a chestnut mare and male quagga—the hybrid was quagga-like, and even the foals subsequently produced from the mare by a black Arabian sire were "much more plain barred across the legs than is even the pure quagga." Now, here is an instance of the positive transmission by the female of one species of the physical peculiarities of the male of another species, with whom she had bred, to her offspring by a subsequent union with a pure male of her own species. This in itself is not a little remarkable, and worthy of investigation, by those who have opportunity, amongst mule-breeders and others ; but, further, I have made many inquiries amongst those interested in the pure breeds of all kinds of cattle, sheep, dogs, poultry, pigeons, &c., and they universally declare that if a high-bred female once breeds with an inferior male, even of her own race, she will never produce pure offspring, though she always, subsequently, breed with males of the highest caste. Thus, if a thorough-bred mare have a colt whose sire is a half bred horse, though she subsequently breed with only thorough-bred horses, her foals will never prove thorough-bred. An instance was lately mentioned to me much in point, where a very pure-bred setter bitch produced her first litter after a cur dog, and, though subsequently put to some of the best setter dogs in the kingdom, her puppies were never pure or worth keeping. We know that the greyhound breeders cross with a bull-dog to give their greyhounds courage and tenacity of purpose, and that it does this for many generations ; but that it is effected by always breeding from the progeny with greyhounds, subsequently to the first bull-dog cross. It would be curious to inquire whether the greyhound bitch subsequently breeding with pure greyhound, her progeny would show a similar transmission of the courage of the bull-dog, as we have seen it take place in the markings of the quagga, an the worthless peculiarities of the cur.

Now, we only too well know that many diseases are capable of hereditary transmission, some more, some less ; and I cannot but think the facts I have alluded to lend some color to the thought, that even as physical peculiarities, so may diseases, be transmitted by the female, through herself and the actual father of her second progeny, as well as all their ancestors, may be free from any taint. In other words, it would seem far from improbable that if a woman married, and had a child by a man who died the subject of any well-marked hereditary disease, and she subsequently married and had children by her second husband, her first husband's disease would have a tendency to show itself in her second family, even though neither she nor her second husband, or their ancestors, were subject to the malady. I presume that one point would be necessary to this, namely, that at the time of impregnation by the first husband, he was then either absolutely suffering from or very strongly predisposed to the disease transmitted. The investigation of this very curious and interesting question would incidentally throw much more light on how far constitutional peculiarities and diseases, such as gout, tubercle, insanity, &c., may be communicated by seminal transmission to the female, and be of considerable importance in determining many medical and social questions, as the first husbands of widows, who re marry and bear children, have frequently died of the severer forms of disease well known to be capable of hereditary transmission.

Let Animals have Daily Exercise.

The *Stock Journal* says :—"Horses requ're daily exercise in the open air, and can no more be expected to exist without it than their owners. Exercise is an essential feature in stable management, and like well-opportuned food, tends alike to preserve the health of horses. Daily exercise is necessary for all horses unless they are sick ; it assists and promotes a free circulation of the blood, determines morbific matter to the surface, developes the muscular structure, creates an appetite, improves the wind, and finally invigorates the whole system. We cannot expect much of a horse that has not been habituated to sufficient daily exercise ; while such as have been daily exercised and well managed, are capable not only of great exertion and fatigue, but are ready and willing to do our bidding at any season. When an animal is overworked it renders the system very susceptible to whatever morbid influences may be present, and imparts to the disease they may labor under and unusual degree of severity. The exhaustion produced by want of rest is equally dangerous ; such horses are always among the first victims of disease, and when attacked their treatment is embarrassing and unsatisfactory."

THE Emperor of Russia, by advice of his Council, has authorized the importatian into Odessa and other Southern ports, for six years, for the purpose of trial, the following articles :—

1. Detached portions of agricultural instruments—as plowshares, coulters, teeth of harrows and cultivators, cast-iron wheels for wheelbarrows, free of duty.

2. Shovels, spades, rakes, pickaxes and steel pitchforks, at a duty of fifty kopecks per pound.

American manufacturers of Agricultural implements should take advantage of this opening for the sale of some of their productions, which are well known to be unrivalled.

ANIMALS that are permitted to roam in the salt marshes are generally the most healthy, as they consume a large amount of saline material. The antiseptic property of salt is too well known and appreciated by most husbandmen, and the farmer might as well think of entirely dispensing with food as to fail in seasoning food with salt. No animal can long exist without salt ; in the stomach it operates favorably, and has a healthy action on the liver, it also prevents the food from running into fermentation, and is death on intestinal parasites.

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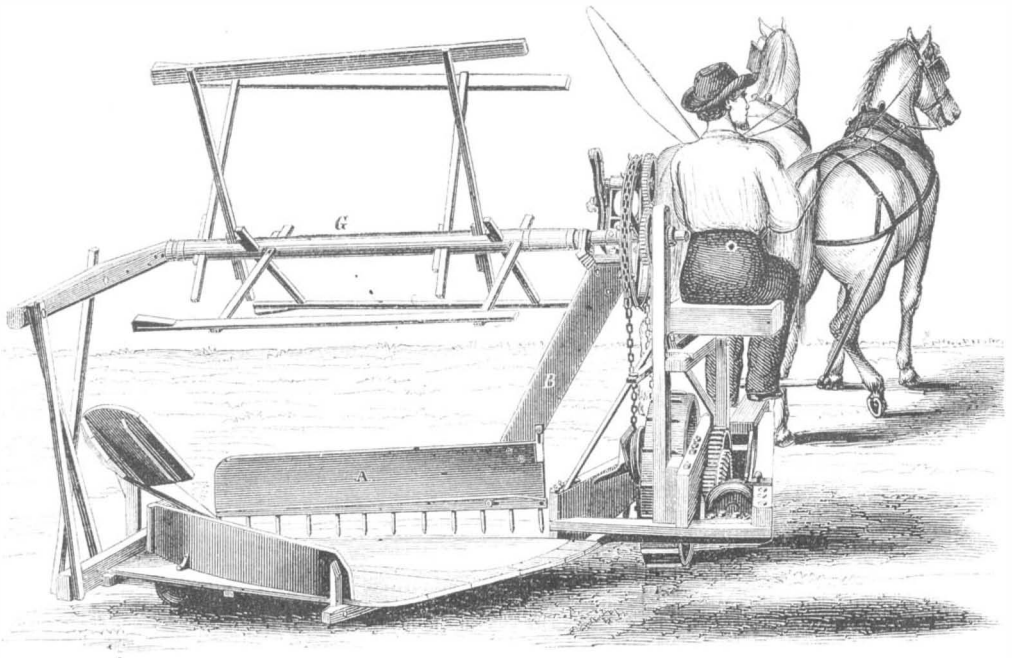
Improved Self-Raker for Harvesters.

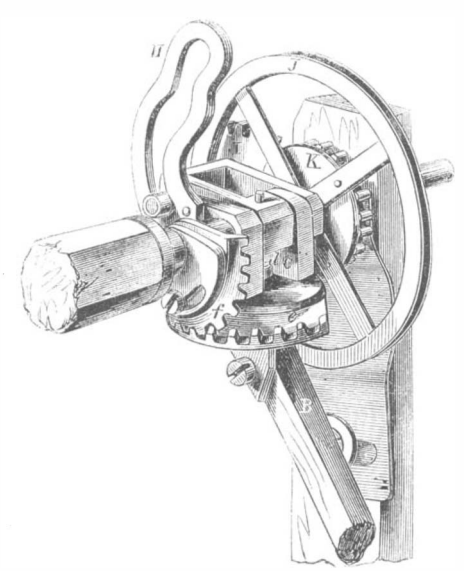
The invention here illustrated is one of the most ingenious in the agricultural line that we have examined for a long time. Ever since the introduction of reaping machines efforts have been made to devise a self-acting rake, to clear the platform of the grain, so as to dispense with the operator employed for that purpose. The motions required in this operation are very peculiar. The rake must sweep across the platform in a horizontal direction, and then be carried over the reel ready for the next sheaf. The novel mechanism by which these motions are obtained in this rake will be understood by an inspection of the engravings, of which Fig. 1 is a perspective view of a reaper, with the rake attached, and Fig. 2 is an enlarged view of the gearing.

The rake, A, is supported by a beam, B, and for the horizontal sweep this beam is attached to the loose collar, C, on the reel shaft by a vertical pivot, *d*. It is manifest that by swinging the beam around this pivot the rake will be swept horizontally over the platform of the reaper. To swing the beam around the pivot, *d*, the horizontal segment, *f*, is secured rigidly to the beam, and engages, by a beveled gear, with the vertical segment, *f*, which is fixed rigidly to the shaft of the reel, G. The reel is turned by a chain from the axle of the driving wheel of the reaper, which passes around a pulley, J, on the reel shaft.



RUSSELLS'S SELF-RAKER FOR HARVESTERS.

After the rake has passed across the platform and removed the grain, it is lifted up and carried over the reel. To effect this movement an arm, H, is fixed rigidly to the collar, C, and a slot is cut in this arm to receive the end of a crank attached to one end of the axle of the pinion, I. The journals of this axle are secured to the pulley, J, so that the pinion, I, is carried around the shaft of the reel at each of its revolutions. The pinion, I, meshes into the fixed



pinion, K, having an equal number of teeth, which causes it to revolve once on its own axis during each of its revolutions around the shaft of the reel. This imparts such motion to the crank on the end of the axle of pinion, I, as to bring this crank to the lower end of the slot in the arm, H, just as the rake has completed its passage across the platform, and then this crank, in its onward movement, carries the collar, C, and with it the rake, around the shaft of the reel.

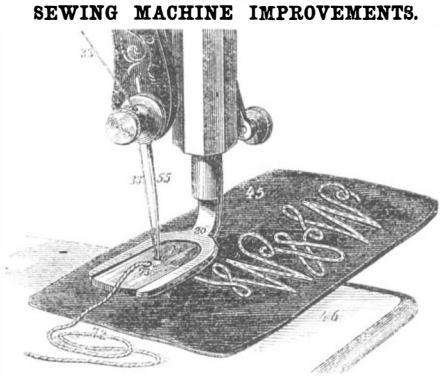
During this revolution the crank is carried to the outer end of the slot in the arm, H, and the segments, *e* and *f*, are turned back, ready to repeat their operation of sweeping the rake over the platform.

The patent for this invention was granted March 29, 1859, and further information in relation to it may be obtained by addressing the inventors, Isaac S. and Henry R. Russells, at Newmarket, Md. [See advertisement on another page.]

Surface Condensers and Boilers.

In the article on the above subject, page 245, present volume, Scientific American, illustrated with Sewell's condenser, it is stated that the boilers of one of our naval steamers which had a surface condenser had become honeycombed. We alluded to the *Dacotah*. Since then we have been informed on good authority that the first reports circulated respecting the boilers of this steamer were greatly exaggerated. In 1859 this vessel went on a voyage to the East Indies, having Sewell's surface condensers and tubular boilers, with brass tubes. Word was sent back to the Naval Department that her boilers were rendered almost useless going out, and upon this information orders were given to have new boilers made and ready to be put in when she returned. She arrived in New York a few months since, and was about proceeding to Boston to get in her new boilers, but, before doing so, her engines and boilers were thoroughly examined. To the surprise of many persons he found the boilers quite good, and the result is the *Dacotah* is now at sea and in active service with her old boilers. Mr. Sewell has informed us that all his condensers hereafter to be made for the U. S. steamers will have tinned tubes and iron feed pipes.

SEWING MACHINE IMPROVEMENTS.



We herewith illustrate further improvements added to the Wheeler & Wilson sewing machine, namely, the "braider," a device for sewing braid or cord upon any kind of fabric. The braid or cord is passed through the hole, 72 (see engraving), of the ordinary glass presser, 71, of the machine and stitched upon the fabric, 46, in the most elaborate designs without any previous basting. Its value is best set forth by a lady's hand as follows :—

A new improvement has lately been added to the Wheeler & Wilson machine(which, by the way, we considered long ago to be as nearly perfect as any human contrivance could be), being an attachment for sewing braid upon cloth, silk or any material. If any of our friends have been through the tedious operation of braiding children's dresses, they will realize the great relief that awaits them in this invention. The braid follows the needle with perfect accuracy, taking any curve desired, so that the most intricate pattern may be braided with great rapidity. Every lady may now possess one of those lovely chambray morning robes embroidered in vines and labyrinths of white braid, which have heretofore fallen to the lot only of the most industrious and ingenious. For summer dresses nothing can be more elegant and becoming. We hail this improvement as a confirming evidence of "a good time coming" for the ladies one and all. And we may as well include the gentlemen, for there will doubtless be an immediate harvest of elaborate smoking caps, and velvet slippers embroidered with gold braid. Long live the sewing machines!

Patent Moss Baskets.

At the spring exhibition of the Brooklyn Horticultural Society (just closed) Mr. Chamberlain exhibited some of his patent baskets, filled with the choicest plants, vines and flowers, growing in the greatest luxuriance and vigor, filled with both fruit and bloom. A black Hamburgh grape vine, with the bunches fully formed, with strong shoots and as promising as any grown in a grapery with all the care and attention that could be bestowed on them by the most experienced cultivator; two baskets containing peach trees, the fruit the size of walnuts, were also shown, in small wire baskets of eight inches diameter; a basket containing an azalia in full bloom, roses, carnations, pansies, fuchsias, variegated-leaved plants, ferns and mosses, all exhibiting a state of growth never attained in pot culture.

For this novelty (which it truly is), the patent for which was obtained through the Scientific American Patent Agency, the Society awarded Mr. Chamberlain a special premium. At the summer and fall exhibitions he proposes to exhibit the fruit fully matured, which will settle beyond any doubt the value of his invention.

Our readers will find an illustration of this new method of cultivating fruit in No. 22, Vol. V. (new series) Scientific American.

Artificial Acetilene.

M. Berthelot, of Paris, has succeeded in a most interesting chemical experiment, resulting in nothing less than the direct combination of hydrogen and carbon. Having for a long time been convinced that by placing hydrogen in contact with carbon, at an extremely elevated temperature, they would combine with each other, he tried the experiment at all temperatures, but, at first, without obtaining the desired result. Finally, the extremely simple and happy idea occurred to him of making a current of hydrogen pass between the two carbon points of the electric light excited by Bunsen's battery of 60 elements, and then his efforts were crowned with success. At this extreme temperature the hydrogen combines with the carbon, and the product of the combination is carbide of hydrogen, discovered some years ago by M. Berthelot, to which he gave the name of acetilene. He has been able to collect sufficient of the product to submit it to numerous experiments, and he finds that it possesses all the properties of acetilene derived from organic sources. M. Berthelot had previously succeeded in—firstly, forming by means of mineral compounds, and by a purely chemical method, the principal carbides of hydrogen; secondly, in transforming these carbides into alcoholic compounds; but this was neither a carbide nor an alcohol resulting from the direct combination of two mineral principles—from carbon and hydrogen. This, however, is only a philosophical production of alcohol, not yet available for manufacturing purposes; though, as a scientific fact, it is both curious and important.

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VOL. VI. NO. 20.....[NEW SERIES.].....*Eighteenth Year.*

NEW YORK, SATURDAY, MAY 17, 1862.

EXTENSION OF PATENTS---FOR WHOSE BENEFIT THEY ARE GRANTED.

There seems to be an impression among inventors that, since the law of March 4, 1861, went into force the previous law in respect to extending patents for seven years was abrogated. This is not so in regard to cases which were patented under the old law. Any patent which was granted prior to March 4, 1861, may be extended for seven years on proper application to the Patent Office, provided the patentee has not already been amply remunerated for his invention and proves to the satisfaction of the Commissioner that he has used proper diligence in attempting to realize gains from his patent. The patentees of 1848 and 1849 should lose no time in making out a statement of their profits and losses in consequence of their pattents, and in seeing counsel in regard to an extension, if they wish the term of these expiring patents continued for another seven years.

It is often the case that the extended term of a patent produces to the patentee a ten-fold profit over the amount realized during the first fourteen years of its existence. The assignees of a patent cannot obtain this extension ; it must be done at the instance of the inventor, for whose sole benefit it is granted.

For full particulars concerning extension, address

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BEET-ROOT CULTIVATION AND SUGAR.

A number of our Western agricultural periodicals have lately advocated the cultivation of the sugar beet for the purpose of manufacturing sugar from it. In Ohio a number of prominent agriculturists have interested themselves in this subject, and it is stated that considerable quantities of the seed have been obtained from France and will be planted this season. The soil and climate of Ohio are stated to be so favorable to its growth, that Prof. F. A. Mott, of Columbus, has experimentally demonstrated that 6,000 lbs. of sugar and 600 gallons of sirup may be obtained from a single acre of beets. A cotemporary stated, a few weeks since, that this gentleman would have ten acres of beets under cultivation this season, and that he was preparing machinery to carry out the manufacture of sugar upon a somewhat extended scale. The present high price of sugar is acting as a stimulant to encourage the beet culture in the fertile regions of the West; and no doubt the great success of the manufacture of beet-root sugar in France also exercises an influence upon such intelligent men as those who constitute the leading members of the State Boards of Agriculture. Some facts in relation to the rise and progress of the beet-root culture and sugar manufacture in Europe will be of interest to all.

So far as we have been able to learn beet-root sugar was first made in 1799, by a chemist in Berlin, Prussia, and ten years afterward, in 1809, it was introduced into France during a time of great scarcity of cane sugar on account of the blockade of the French ports by British cruisers. Napoleon gave it encouragement, and it has ever since been growing in importance. In 1830 the product of beet-root sugar in France was 22,134,162 lbs., in 1840 it had increased to four times that amount. For several years it was protected by heavy duties against colonial cane sugar, but the French colonies having petitioned against such partial taxation, the beet-root was put upon an equal footing with colonial sugar in 1847. Instead of operating against the manufacture of beet-root sugar, its production continued to increase. Improvements in the selection of seeds, in the culture of the plant and in the modes of making the sugar, have enabled the manufacturers of beet-root sugar in France to contend successfully with the manufacturers of cane sugar in the West Indies. M. de Lavergne, a writer on agricultural subjects says respecting it :—"To the farmer of Northern France beet-root sugar has really been the finest agricultural conquest of our age."

We believe that the sugar beet may be profitably cultivated in many sections of our country. The saccharine matter of the root yields the juice of the sugar, and the pulp and leaves form good food for cattle. In France no crop produces so much on the same area of land or is so profitable. The value of the yield ranges from $400 to $600 of gross return per hectare—equal to two acres and a quarter. An analysis of fresh beet root at Geissen, Germany, by MM. Horsford and Krocker, gave the following results :—

Albuminous matter	2·04
Sugar	12·26
Cellulose and nitrogenous substances	2·56
Mineral substances	0·89
Water	82·25
	100·00

The species called the Silesian beet is most highly prized by the sugar manufacturers. It is the chief kind cultivated in France because it yields a large quantity of sugar and its juice is not so liable to putrefaction as that of some other kinds of beets. In European Russia the beet is cultivated up to the 56° of north latitude, and it may therefore be grown with success in all our Middle and Northern States, in sections where the soil is suitable. Neither a heavy compact nor a light sandy soil is suitable for the beet, but a soil between these two extremes. After manuring it the universal practice is to take off two and sometimes three crops before the beet is planted. In good seasons an acre of land will yield 35,000 lbs. In the early stages of its growth the beet requires a great amount of moisture. The plants come to maturity earlier when they are first developed under glass shades like tomatoes, then transplanted during warm and moist days in the field. The rows are set two feet apart and the plants fifteen inches. They are kept free from weeds and worked with the hoe like beets in our gardens, or in fields with the cultivator and the hoe. The sugar in beets attains to its maximum quantity before the root is quite ripe.

In all likelihood several failures will attend our first attempts to cultivate the beet and make the sugar, but success will assuredly follow perseverance.

GOOD INVENTIONS LOST TO THE COUNTRY---IMPORTANCE OF ENCOURAGING INVENTORS---WHAT CONGRESS SHOULD DO.

We believe that our country is being deprived, at present, of the benefits of some very important improvements, for want of a proper board of military and naval officers instituted to test their merits. There are but few inventors who have the means or appliances for testing on a large scale inventions relating to artillery and ships of war. On the other hand, government does possess such appliances, and under the charge of a board of competent officers practical experiments to determine the value of most new inventions, could be conducted at a very moderate expenditure. Several inventors who have gone to Washington, to present to government improvements that appeared to possess great merit, have been told to return home, make experiments upon a large scale, communicate the results, and then the subject would receive official consideration. Such treatment is tantamount to consigning their improvements to oblivion, because the experiments required could not be made without the use of war ships and large guns.

Complaint is justly made that military officers who have secured patents for their own benefit, while under the patronage and in the pay of the government, are allowed peculiar facilities for experimenting and introducing their improvements into the army and navy, while a civilian inventor is told to go home and make his experiments, which the government knows is impossible for him to do. Had Captains Dahlgren and Rodman, for example, been civilians and mere mechanics, our country would not now be in possession and use of the unrivaled guns and modes of casting designed by these two distinguished inventors. What we desire is, to see the same facilities for introducing inventions extended to all inventors who have useful improvements which are adapted to either land or naval service, and we are satisfied Congress cannot perform an act more profitable to the nation than to authorize the Navy and War Departments to appoint a competent board of its officers and engineers to examine and test the merits of such inventions as may be presented for their consideration. An appropriation of $200,000 would be sufficient to test the feasibility of the plan, which, if rightly conducted, will redound to the credit of the nation, by putting our War and Naval Departments in possession of many useful improvements in ordnance and modes of mounting and operating siege guns, armor plates for vessels and fortifications, effective modes of closing port holes, apparatus for puncturing iron-clad vessels below the water line, &c.

We have had submitted to us very ingenious plans for improving nearly all the present modes of offensive and defensive warfare, and some of the plans seem very feasible, and, in our opinion, worth testing. One of the most ingenious plans for closing the portholes of a vessel or embrasures of a fort, was shown to us a few days ago by an inventor who had just returned from Washington. He was told at the War and Navy Departments that his plan seemed very good, but they had no money to expend for testing new inventions, and he had better go home and test the invention himself. The poor inventor humorously remarked to us that he supposed they expected him to build a fort or war vessel, and fill it with an armament sufficient to test the invention. His experience forcibly illustrates the summary way a patriotic inventor is disposed of by officials, after he has labored for months to study out an invention which he thinks, if adopted, will prove the destruction of his country's enemies.

We again, in behalf of the inventors of our country, call upon Congress to make some provision for examining all inventions pertaining to war, by land or sea, which may be presented for consideration, and for testing on a limited scale such of the number as seem most likely to prove useful.

PARAFFINE.

Most bituminous substances, when treated by distillation and other refining processes, yield a beautiful white substance, resembling sperm, called paraffine, which name it has received on account of its inert character, when brought into contact with a great number of corrosive agents. Sulphuric acid, which converts wax and spermaceti into a blackened mass, has no effect upon it at ordinary temperatures ; and nitric acid, which oxidizes nearly all organic bodies with great rapidity, exerts no action upon paraffine except at very elevated temperatures. The strong alkalies—potash and soda—which convert oils and fats into soap, do not exert such action upon paraffine. It is as white as the purest bleached wax, and it makes candles of great illuminating power. It is obtained in the greatest quantities from the oils of distilled cannel coal. The paraffine oil is the heaviest which passes over from a still in the distillation of coal tars—its specific gravity ranging from ·900 to ·930. It is placed in a vat and cooled down with ice or other refrigerating agents, when it crystallizes in large scales. It is then lifted and strained, placed in bags, and submitted cold to severe pressure. It is then remelted and treated with half its weight of strong sulphuric acid, at a temperature of 356° Fah. The acid removes any impurities, consisting of bitumen, that may be in it, after which it is washed with water, run into cakes, and pressed again, while warm, in a hydraulic press. It is again melted and treated with caustic potash in solution (some use alcohol) to remove any resinous matter that may be left, after which it becomes as clear as water before solidification. It is now admitted that there are several varieties of paraffine, but there is little to distinguish them excepting their melting points, which range from 113° up to 139° Fah. Aniline colors impart to paraffine candles most beautiful red, purple and violet tints.

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BRITISH PATENT LAW REFORM.

In the city of Manchester, a society called "The Manchester Patent Law Reform Association" has been in existence for some time and it numbers some of the most distinguished men in England, among its members. At one of its late meetings, the chairman, Mr. Wm. Fairbairn, presented the report of a committee, which had been appointed to draw up certain propositions for adoption as reforms of the present British patent laws. The first proposition submitted was for a system of examination (like that which prevails in America) of applications for patents. It was to the effect that the examination of applications be vested in a Board consisting of three persons—a mechanical engineer, a chemist and a barrister—with competent assistants, who should devote all their time to the business of examining and acting upon the cases of applicants for patents and who should receive liberal salaries. This proposition was adopted. Another for the reëxamination of rejected applications was also carried, likewise one for the payment £50 at the end of the fifth year of a patent term, instead of £150, the present fee. Several other resolutions were adopted embodying as a whole a reform in the British patent law, which if carried out will make the English patent office nearly similar in its mode of operation to our own. One proposition for the trial of cases for infringement, deserves attention as being an improvement on our system. It is "that all cases of infringement shall be tried in the *first* instance in any of the ordinary law courts before a special jury of gentlemen *conversant with the matter in dispute.*" Petitions to the Houses of Lords and Commons praying for the enactment of a bill founded on the various propositions agreed to were also adopted, and Lord Brougham and Mr. Bazley, M. P., requested to present them.

OPERATIONS AT THE BROOKLYN NAVY YARD.

Great activity is exhibited at the Brooklyn Navy Yard. A force of more than three thousand men are constantly employed in it. A large number of workmen are engaged in preparing the different classes of ammunition needed by our vessels on the enemy's coast and rivers. The huge piles of dusky cannon balls which formerly lay year after year along the walks of the yard have generally given place to new shot, which are painted red and black, and lie in piles ready for shipment. These are generally larger in size than the old shot. Great numbers of spherical shells are also cast and prepared at this Navy Yard, and a large number of Dahlgren guns and Columbiads, ranging from eight to eleven inches in caliber have lately been received and are arranged in rows in the yard. A number of these Dahlgrens have bronze trunnions shrunk on and secured with double iron straps. A few large rifled Parrot guns and Wiard steel guns have also been received ready to be forwarded to any point where they may be required. The immense resources of this yard do not allow of any diminution in the aggregate supply of war material, of which there is a vast quantity of almost every description adapted to the naval service. The new sloop of war *Adirondack* is now being built and several vessels are being repaired. The frigate *Roanoke* is in the dock, and is undergoing alterations which will soon fit her to receive a coat of mail. Her sides have been cut down to a point not far from the water line. At this point, it is stated, a bomb-proof deck will be built, and two or more turrets, like that on the *Monitor*, placed thereon. The immense hull of the vessel, which will be lightened as much as possible, is strong enough to bear a vast weight of iron, and to carry it with ease. Her timbers and fastenings are as sound, apparently, as when she was built. Immense naval and military stores are shipped weekly from this Navy Yard.

ORDERS have been given to the Minister of Marine to hasten the construction of the iron-cased floating batteries in the French dock-yards. The following floating batteries are to be launched this month: The *Peiho*, the *Saigon*, the *Palestro* and the *Peschiera.* These are to be armed with fourteen guns each.

THE *Royal Sovereign*, a British wooden three decker steam frigate, is being converted into a cupola war ship, with a powerful iron beak blow the water line, so that she may be used as a steam ram.

CAST-IRON MOLDINGS.

A very interesting paper was lately read upon this subject by Mr. Oubridge, before the London Association of Foremen Engineers. He stated that those who conducted the processes of manufacturing iron castings, were little, if at all, indebted to any published works on science or art. They depended mostly on their own ingenuity and personal experience in conducting the work intrusted to them, as there were no general recognized rules laid down for their guidance. The different qualities of pig iron was an intricate subject to understand, because there was such diversity among them, and without a knowledge of their nature a molder could not manage a business. The density of one brand sometimes differs from another to the extent of 12 lbs. to the cubic foot, and as the cohesive strength is generally in proportion to the density of iron, a molder must know this to produce castings for different purposes. There is also great diversity in the crystallization of different pig irons. That made from Scotch black band ore has very large crystals and it possesses little cohesion, until it is melted several times, while that made from the red hematite ore is fine in the grain and is much stronger. The fusibility and fluidity of pig iron also differ greatly. The rich black band iron retains its fluidity much longer than the Staffordshire or Welsh cast iron. Some pig irons are distinguished for a fine firm grain, others by purity and freedom from dross, and others by the beautiful polish which is capable of being given to castings. With all these different traits and qualities of the brands of pig iron, the foreman of a foundry should be well acquainted. In some kinds of pig iron, impurities constantly rise to the surface, when it is in a fluid state. These should all be removed before the metal is poured into the mold. No laws have been laid down for practical molders in relation to the treatment of the different kinds of pig iron, consequently the practical founder is frequently obliged to resort to "the rule of thumb." Scientific men are almost entirely ignorant of the diversified qualities of pig iron. The mixture of various irons for producing castings suitable for different purposes, are only known empirically to practical molders and mechanics. There is a wide field open for scientific research in connection with pig iron. A plate of iron cast in open sand is one-third weaker than one cast covered and having a sufficient head of metal to give it uniformity of pressure. The principles which should guide the founder in supplying metal to molds to produce uniform castings are but little understood. Several years ago, when Mr. Oubridge was in Liverpool a number of large rolls for sugar mills were to be cast in the foundry with which he was connected. Different castings were made with repeated failures. They were unsound, and although several heads in pouring the metal were used and constant feeding into the molds practiced, half a dozen of rolls were cast and all condemned for the want of homogeneity. Being consulted by the head foreman of the establishment with regard to the cause of failure, Mr. Oubridge suggested that instead of using four heads, one above each arm of the roll, the mold should be made eighteen inches higher, and an annular head double the thickness of the roll be made. This plan was adopted and succeeded perfectly; not another failure occurred. This system he always applied to the castings of large cylinder covers, and all castings which demanded homogeneity and uniform crystallization of the metal.

NEW-YORK RAILWAYS.

The annual Report of the State Engineer—Van R. Richmond—has lately been published, and contains some general interesting information. The length of single track, not including cities, is 3,984 miles; number of engines, 755; of first-class cars on all roads, 1,223; number of baggage and mail-express cars, 244; freight cars, 9,592. Miles run by passenger trains, 17,241,021, of which there was only 6,058,126 on country roads. Passengers carried 58,128,679; exclusive of cities but 8,684,189. Freight in tuns carried, 5,460,409. Average speed of ordinary passenger trains, including stops, 20.26 miles per hour; average speed in motion, 24.89 miles; speed of express trains in motion, 31.87 miles per hour; including stops, 27.50 miles. Earnings from passengers on all railroads, $9,533,934, of which $7,264,160 were on country roads. Total earnings of passengers and freight, $23,535,469. Number of passengers killed, 12; injured, 34. Employés killed, 59; injured, 23; number of others killed (run over, &c.), 91; injured, 60. Total number killed, 162; injured, 117. The average cost per mile of single track was $32,827 35; average number of miles traveled by each passanger, 38.91. Average number of passengers in each train, 55. Average cost per mile of single track for maintaining roadway, $1,097 92; average cost per mile of single track for operating it, $1,623 44; for repairs of machinery per mile of single track, $658 76; average number of persons carried for one killed, 1,240,598. The number of passengers carried on city railroads last year was no less than 49,444,490—upon the other roads only 8,684,189.

These statistics afford gratifying evidence of the increasing security to life in our railway travel. Only twelve passengers out of fifty-eight millions carried lost their lives last year.

CLOTHES WRINGERS.

For the information of New England people we would state that the address of N. A. Rhoads, manufacturer of clothes wringers, is Waterbury, Vt. Mr. Rhoads's improvement is rapidly finding its way into popular favor, of which it is justly deserving. It is one of the best devices of the kind that we know of. The pressing rollers are of rubber, and their squeezing power is increased at pleasure by simply moving a small lever which operates a cam shaft. All the parts are strong, durable and effective, and the machine will wring out every species of household fabric, from a bed quilt to a lace collar, with the greatest rapidity and success. The clothes wringer has become an important adjunct in domestic economy.

Speaking of clothes wringers reminds us of an amusing incident in connection with them that came to our knowledge not long ago, which illustrates the way in which the best inventions are sometimes brought into disfavor. A gentleman sent home a wringer with directions for the domestic to put it into use on the next washing day. "Well, Biddy, how do you like the wringer?" was the inquiry on his return, a few weeks after. "Arrah, indade, sir, the machine is good for nothin at all," was the prompt reply; "the clothes are as wet as ever, and I can squaze them bether wid me own hands." This opinion was corroborated by all the family. So the boss went down stairs and requested Biddy to show him how she used the machine, which she did, by taking great pains to insert the clothes *above the rollers*, and then pulling the articles through with one hand while she turned the crank with the other! Of course it needed but a moment to demonstrate to Biddy the superior convenience and advantage of placing the clothes *between the rollers*, and after that the wringer was extolled as the most wonderful boon that poor Biddy had ever enjoyed.

The Census Returns of 1860 Worthless.

We have received from Charles L. Flint, Esq., Secretary of the State Board of Agriculture, of Massachusetts, a pamphlet of the agricultural statistics of the State. In some remarks at the close, it is conclusively shown that the statistics collected by the United States Census Marshals for the census of 1860 are wholly unreliable. The errors are monstrously absurd. For instance,

In the returns for the town of Haverhill not a single tun of hay is returned among the products of *forty farms*. In the returns of products for the town of Westfield, 4,000 pounds of rice are given; for Mendon, 273; for Stow, 90; for Rowley, 10 pounds. Believing these entries to be incorrect, the several persons so reported as rice producers, have been interrogated, and the result confirms previous belief. One who was returned as having raised 2,500 pounds of rice, declares the statement to be "a mistake," as he "never raised any rice." Another, reported to have raised 90 pounds, affirms it to be "a great mistake," as he "never raised any." A third, reported to have raised the modest amount of ten pounds, replies that it is "an entire mistake." And so of the others! It should, however, be stated, rather as a serious defect in the census blanks, than as a fault of the marshals, that there appears to be no appropriate schedules for the return of horses, cows, &c., owned by persons other than farmers, and consequently but few, or none, such are returned. Thus we find no horses returned by the marshals for Boston, while the assessors for the same year return 5,111.

Probably the traitors in Buchanan's cabinet had imperfect blanks prepared for the express purpose of making the census statistics worthless.

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RECENT FOREIGN INVENTIONS AND DISCOVERIES.

Armor for Ships.—A patent has been taken out by F. Wrigley, Manchester, England, for making the armor for war ships of a cellular form. This armor is made by casting Bessemer metal in molds, then annealing the metal, to give it the quality of soft, homogeneous metal. The sides of the vessel are to be formed with ribs of T-iron, and the cellular armor is to be fitted on these ribs and held by them with cross keys, so as to avoid using bolts or other like fastenings. C. W. Eddy, of London, England, has secured a patent for applying a movable iron beak to a war vessel, by which she may be used as a steam ram, when required—the beak not to be used during times of peace, as it retards the speed of a vessel at sea. He also adapts the iron prow of his vessel to receive a shell for exploding it in the hull of an enemy's vessel.

Treating Hides to Make Leather.—A peculiar process has been patented by H. C. Jennings, London, England, for converting hides and skins into leather, without the use of common vegetable tanning substances. The hides are treated in the usual manner, at first, by fermenting, or liming, to remove the hair, after which they are well washed, and are then laid horizontally and evenly in a perforated frame, which holds about ten hides. This frame has a ring in it, for the purpose of enabling it to be easily lifted into and out of the vat. Each skin is separated by a wicket hurdle, to permit the free penetration of the liquor on all sides. The pits or vats for tanning are ranked No. 1 and No. 2. The first is charged with a solution of alum, to which is added two per cent each of sulphuric and hydrochloric acid. Vat No. 2 is charged with a solution of the carbonate of soda, to which is added five per cent of the tungstate of soda. The frames containing the hides are lowered into the vat No. 1, where they remain six hours; they are then lifted out and allowed to drip over the vat, then placed in vat No. 2, where they remain six hours. In this way the frames containing the hides are alternately steeped six hours in the two vats containing the acidulous and alkaline liquors, until the hides are saturated and their gelatine converted into leather—a fibrous, insoluble product. The hides are then steeped in a pure solution of the tugstate of soda for six hours, and afterward thoroughly washed in soap suds and rinsed in clean soft water. To give the skins thus treated the smell and color of common tanned leather, they may be lastly steeped in a liquor of oak bark for about twenty-four hours.

Treating Flax.—A patent has been obtained by J. Kane, of Templemoyle, Ireland, for removing the gummy matter in flax, by steeping it in caustic ammonia. The object of using this liquor, instead of steeping in warm water, by Watt's process, is simply to hasten the common fermenting operation, by which the fibrous part of flax is separated from the gummy portions.

A New Fibrous Material from the Hop Plant.—A vegetable material, resembling wool, has been obtained from the hop plant, and a patent applied for by R. A. Brooman, London, England. The plants are first dried, then crushed between rollers, and subsequently beat with stampers and revolving beaters, when the vegetable, wooly, fibrous material is separated, and may then be carded.

Optical and Illuminating Apparatus.—A peculiar apparatus, furnished with glass compartments, filled with transparent and colored fluids, for general illuminating purposes, and the production of effects similar to white and colored fire, has been patented by W. Clark, London, England. The compartments of glass are hollow, globular spaces, containing liquids producing the necessary refraction. The light is transmitted through these fluids, and thus they produce varied and novel effects for public entertainments.

THE Corliss Steam Engine Company, of Providence, R. I., have done a fair amount of work during the past year, notwithstanding the dullness of trade. Among the large engines recently put up by them in neighboring cities are a pair of 900 horse power for the Naumkeag Steam Mills, Salem; one each of 450-horse power for the Wamsutta Mills, New Bedford, Atlantic Mills, Lawrence, and Lowell Bleachery and Dye Works, Lowell.

American Enterprise and British Jealousy.

We copy the following from *Lloyd's Weekly London Newspaper*. It is a sensible discussion of Mr. Train's city railway project, and quite complimentary to American enterprise:—

There is a conservative principle in all English thought and action, which is occasionally a very important and useful element in our national character. But like many of the best things, it has its abuses, and unhappily these are not few in number, or small in dimensions. A steady and deep-rooted respect for the actual frequently prevents us from attaining the possible, because, with a morbid timidity and foolish suspicion, we fancy that all change must necessarily be bad. Hence, any reform of a social kind, calculated, perhaps, to largely increase the convenience and comfort of those whom it affects, will be regarded with as much distrust and dislike as if it was a perilous innovation in politics, fraught with the darkest and most insidious designs against the throne, the altar and the House of Peers.

To some such sacred British prejudice must be owing the large amount of disfavor in which Mr. Train's attempts to facilitate the traffic of some of our larger thoroughfares have been held. Rival omnibuses have courted collision and concussion with them. Audacious cab drivers have drawn their lumbering four wheelers across the line to obstruct the Yankee omnibus, at great risk to their own persons and their employers' property. And at last a jury in Surrey have found that Mr. Train is guilty, in complicity with various members of the vestry of St. Mary, Lambeth, of having created a nuisance by laying down his tramway upon the Westminster-bridge road. By an arrangement quite incomprehensible to any but a well-trained legal mind, a verdict is entered against Mr. Train, but not against the vestry. Certain points of law are reversed, but surely these points of law would as much protect Mr. Train as they would the vestrymen. But a jury has found that the tramway is a nuisance, and it is to be speedily removed.

Now, we do not like to attribute motives to a jury but we fear that the members of this particular one treated Mr. Train just as any other metropolitan or suburban jury would have treated him. There exists among a vast number of people a strong feeling against this attempt to relieve our overcrowded thoroughfares, because the scheme is new; because it interferes with the interest of the present omnibus proprietors; and because it is the scheme and venture of an American, and not an article of home invention. Mr. Train has, we fear, to thank himself for much of this opposition. We are a steady-going, sober-minded people, and we like business done in a business-like way. Any noisy attempt to recommend a project, however admirable, is sure to imperil or defeat its success. Hence, breakfasts and banquets, bands of music, verbose oratory with its usual accessories of song and toasts, were in vain had recourse to by this transatlantic speculator. But Mr. Train, not contented with lavishing turtle and champagne in connection with this scheme, began to make himself prominent as the champion of the North *v.* South in the great American quarrel. He would not at first tolerate the neutrality to which, as a government and a people, we have so wisely adhered. All this was not calculated to make him popular, or to keep his tramway in good repute.

We regret all this. We cannot see why this method of locomotion, which has succeeded so well in Paris and in New York, should fail in London. The vehicles are large, roomy, comfortable, move pleasantly and easily, and the entrance and exit are very different from the rush or the occasional tumble out of our own clumsy, ill-constructed, noisy and incommodious omnibuses. Great things were to have been done by the French company who gathered under their comprehensive care all our vehicles. Have they in any way improved them? Have they even painted them? Are they not, from their noise and their ugliness, a scandal and an eyesore in our streets? And yet, when something like a feasible plan of improving our London locomotion is attempted, because it is not carried out in the discreetest manner, and because it slightly interferes with vested interests, we indict its promotor and vote it a nuisance. And so we are left for the present without hope of any reformation of a crying evil.

The following, taken from the London *Mechanics' Magazine*, is on the same subject. It will be seen that this journal and *Lloyd's Newspaper* take the same views in regard to the treatment of Mr. Train:—

We have frequently had occasion to call attention to the tramways recently put down, in some of the streets of London, by Mr. Train. We have regarded them as public benefits, and such, we believe, is the opinion of a vast majority of the inhabitants of the metropolis. But Mr. Train has been singularly unfortunate; in fact he has not had fair play. He has not been permitted to carry out his plans and extend the benefits his plans would confer on society. At Bayswater he was defeated by an aristocratic clique. In Victoria street he was the victim of local prejudice, and in Kennington road he has been checkmated by an obstinate and impatient jury. Being present at the trial at Kingston, we can speak from practical knowledge. Mr. Train and several of the Lambeth vestrymen were indicted for causing a nuisance by the Lambeth tramway. Several witnesses were examined for the prosecution, and before a single witness was called, or a single word was said on behalf of the defendants, the jury interrupted the trial and said they were perfectly satisfied the defendants were guilty. Possibly they might have come to the same conclusion had they heard what could have been said on the other side; but the very least they could have done was to have let the trial take its ordinary course, and decide according to the evidence. But they exhibited an indecent haste. "Strike but hear," is a motto as old as the hills. The Kingston jury were determined to strike without hearing; and if one of their number is to be believed, they made up their mind before they came into court. If so, they were untrue to their oaths, wherein they undertook to decide, not in obedience to preconceived notions, but according to the evidence. We are surprised at the unusual and unfair course taken by the jury, and we are equally surprised at the judge permitting such a farce to be enacted in a British court of law. The counsel for the defendants stated that they were prepared to submit overwhelming evidence to prove that the Lambeth tramway was almost universally appreciated, and that thousands every week participated in the benefits it conferred; and that instead of being a nuisance it was a public convenience. But the jury were deaf to every thing but their own prejudices and one-sided opinion. Hence justice miscarried in their hands. We hope, for the sake of fair play and the character of Englishmen, that the defendants will have the right of appeal to a higher court.

Government Submarine Vessel.

The launch of the little submarine vessel at Messrs. Neafie & Levy's Works, Kensington, took place, contrary to first arrangements, on Wednesday, April 30th, between four and five o'clock. Ropes were fastened around her as she lay on the wharf, and she was then raised by means of shears, and lowered easily into the water. No one was within her, but Mr. Levy, one of the firm which constructed her, stood upon the top during the launch.

When fairly in the water she lay half submerged, her iron guards being almost level with the surface. Two men went into the interior and tried the effect of the oars or paddles. Although but two or three were moved at once, the vessel obeyed them readily, and when the whole sixteen or eighteen are put in motion, it is believed that she can be propelled with considerable velocity. She will be entirely submerged, when necessary, by means of lead or other ballasting; and it is believed that, when this is accomplished, a very slight variation in weight will suffice to lower her to the bottom or to raise her to the surface. When entirely submerged, the glazed aperture in her roof will keep her lighted.

The present position in which she lies will be her natural one; she will only be sunk when necessary to conceal her operations. With her gothic arched back, and conical bow, she looks not unlike a big sturgeon.—*Philadelphia Inquirer.*

WHEN steam is superheated to about 100° above the temperature of common steam no difficulty is experienced in the lubricating of pistons, and a saving of about 25 per cent of fuel is effected, if the steam is worked expansively.

THIN and narrow magnets are more powerful than those which are broad and thick.

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RECENT AMERICAN INVENTIONS.

Locomotive Lamp.—I. A. Williams, of Utica, N. Y., has secured a patent for an improved locomotive lamp for burning coal oil. The object of the invention is to obtain a lamp which will admit of the flame being supplied with a requisite quantity of oxygen to support proper combustion and at the same time prevent the flame from flickering under the motion of the locomotive and from other disturbing causes which tend to produce an irregular supply of air to the flame.

Railroad Chair.—Francis A. Brown, of Ithaca, N.Y., has secured a patent for an invention relating to that class of railroad chairs which are attached to the ends of the rails between the sleepers. The object is to obtain a chair of simple and economical construction which will not only serve as a secure connection for the rails, but also have a tendency to firmly support the same under the weight to which they may be subjected, the downward pressure having a tendency to bind the ends of the rails and the chair firmly together.

Furrowing Machine.—The object of this invention is to obtain a machine of simple and economical construction, which will furrow or mark land in check rows, that is to say, with marks or furrows crossing each other at right angles, and perform the work by a movement across the land in one direction only, and also be capable of being adapted for making the marks or furrows at different distances apart, as may be desired. Invented by J. R. Dikeman and J. J. Hewlett, of Hempstead, N. Y.

The Age of our Earth.

We extract the following from Agassiz's article on "Methods of Study in Natural History," in the May number of the *Atlantic Monthly* :—

Among the astounding discoveries of modern science is that of the immense periods which have passed in the gradual formation of our earth. So vast were the cycles of time preceding even the appearance of man on the surface of our globe, that our own period seems as yesterday when compared with the epochs that have gone before it. Had we only the evidence of the depósits of rock heaped above each other in regular strata by the slow accumulation of materials, they alone would convince us of the long and slow maturing of God's work on the earth, but when we add to these the successive populations of whose life this world has been the theater, and whose remains are hidden in the rocks into which the mud or sand or soil of whatever kind on which they lived has hardened in the course of time—or the enormous chains of mountains whose upheaval divided these periods of quiet accumulation by great convulsions—or the changes of a different nature in the configuration of our globe, as the sinking of lands beneath the ocean, or the gradual rising of continents and islands above it—or the wearing of great river beds, or the filling of extensive water basins, till marshes first and then dry land succeeded to inland seas—or the slow growth of coral reefs, those wonderful sea-walls raised by the little ocean-architects whose own bodies furnish both the building stones and the cement that binds them together, and who have worked so busily during the long centuries, that there are extensive countries, mountain chains, islands, and long lines of coast consisting solely of their remains—or the countless forests that must have grown up, flourished, died and decayed, to fill the storehouses of coal that feed the fires of the human race to-day—if we consider all these records of the past, the intellect fails to grasp a chronology for which our experience furnishes no data, and the time that lies behind us seems as much an eternity to our conception as the future that stretches indefinitely before us.

THE Inland Propeller Line from New York to Baltimore, connecting with the Baltimore and Ohio Railroad, make the trip through in about thirty-six hours. The line lately added two new iron steamers to their route. They are now running ten iron steamers having water-tight compartments.

INVENTORS and manufacturers of roller washing machines are referred to an advertisement of the Metropolitan Washing Machine Company in another column.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING APRIL 29, 1862.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

35,067.—Ethan Allen, of Worcester, Mass., for Improvement in Revolving Firearms :

I claim, first, The combination of parts, m k and H, of lever, H being hung at the cock, substantially as specified and for the purpose set forth.

Second, Inserting screw, p, in cock, F, in such a manner that the size of the notch can be regulated from the outside of the arm by turning said screw, as described.

Third, The rack, K, and pinion, M, for operating the center pin, substantially as specified.

35,068.—J. F. Allen, of New York City, for Improvement in Steam Engines :

I claim a cup slide valve, having formed in it a passage which is independent of the exhaust cup, and which opens on the face of the valve in front of and behind the said exhaust cup, in combination with an elevated seat, or one of equivalent form ; when the said valve and seat are so arranged relatively to each other, that at proper times two passages are opened for the entry of steam into either end of the cylinder, substantially in the manner and for the purposes set forth.

35,069.—J. F. Allen, of New York City, for Improvement in Slide Valves of Steam Engines :

I claim the employment of a slide valve, formed as specified, in combination with the described seat, when so arranged relatively to each other, that an opening, equal in breadth to twice the distance traversed in the same time by the valve, may be made into one end of the steam cylinder, in the manner, and for the purpose aforesaid.

35,070.—John F. Allen, of New York City, for Improved Link Motion of Steam Engines :

I claim the combination of a single link motion, or its equivalent, as specified, with one or more steam valves and one or more exhaust valves ; the steam valves having movements independent of and differing from those of the exhaust valves, when all the said valves receive their respective movements from the single link motion aforesaid, substantially in the manner set forth and for the purpose specified.

35,071.—John F. Allen, of New York City, for Improved Valve Gear for Steam Engines :

I claim the combination of the valve-driving lever, a, and a single eccentric, or of their respective equivalents, when, substantially in the manner described, the said lever receives from the single eccentric movements which are similar to the movements of the link in the Stephenson's link motion, adapting the device as a substitute for the link motion aforesaid, as set forth.

35,072.—S. A. Bailey, of New London, Conn., for Improved Wringing Machine Cylinder :

I claim the employment of the rods, a a a a, in combination with the shaft, A, and rubber cylinder, B, for the purpose of securing the rubber and preventing it from turning during the operation of wringing, as is fully set forth.

35,073.—L. W. Beecher, of New Haven, Conn., for Improved Fruit Basket :

I claim using paper for baskets, instead of wood, or other material, fastening the same together with glue or other like matter, and coating the whole with varnish or other preparation that will withstand moisture, substantially as and for the purpose specified.

35,074.—Pardon Boyden, of Sandy Creek, N. Y., for Improvement in Snow Plows for Railroads :

I claim the construction of the frame or body of the plow, as set forth, in which traverse two endless removers or elevators, which effectually deposit the snow clear of the machine and the railroad.

35,075.—Albert Brown, of Mifflinsville, Pa., for Improvement in Flour Packing Machines :

I claim, first, The method of imparting rotary motion to the propeller or other rotary flour-packing device so as to allow of its rotation at variable elevations by passing the propeller shaft through the sleeve of the main gear wheel, said sleeve being provided with friction rollers impinging upon and working within grooves or ways arranged along the said shaft, substantially in the manner set forth.

Second, In combination with a stationary hopper or spout for the conveyance of the flour to the bag to be packed, I claim the adjustable funnel constructed and arranged substantially as described, so as to be readily adjustable to the stationary hopper, and securely hold the opening of the bag distended, substantially as shown and described.

Third, I claim the arrangement described of one double-winged screw propeller over the other so that while the one shall evenly spread the flour in advance of the other, the latter shall press the flour thus spread.

35,076.—F. A. Brown, of Ithaca, N. Y., for Improvement in Railroad Chairs :

I claim the employment of the central box, C, in combination with the chair, A, and supporting wedge, D, as and for the purpose shown and described.

35,077.—James Budd, of Sandy Hill, N. Y., for Improvement in Pumps :

I claim, first, The two induction pipes, I' Q, in combination with the chamber, G', provided with the valves, G S, and all arranged substantially as and for the purpose set forth.

Second, The combination and arrangement of the two nozzles, M M', chamber, L, and valve, N, and eduction pipe, K, substantially as and for the purpose set forth.

[The object of this invention is to obtain a pump, by which water can be drawn simultaneously from two different fountains or reservoirs, or drawn from either separately, as desired, and also ejected simultaneously from two different nozzles or eduction pipes, or from either separately, and at the same time not involve the necessity of any complicated arrangement of parts.]

35,078.—E. F. Burrows, of Mystic River, Conn., for Improved Self-acting Brake for Railroads :

I claim the combination of the toggles, E E F F, shoes, G, and rods, D, provided with the collars or stops, I, all being arranged and applied to the car or other vehicle, substantially as and for the purpose set forth.

I also claim the projections, J, attached to the rods, D, in combination with the pins, L, for the purpose specified.

I further claim the levers, M, when used in connection with the rods, D D, and provided with the projections, J, the toggles, E E F F, and shoes, G, all combined and arranged as and for the purpose set forth.

[The object of this invention is to obtain a brake for horse-railroad cars and other wheel vehicles, which will be self-acting, and at the same time admit of being operated at the will of the driver, like the ordinary hand brakes in use.]

35,079.—Lysander Button and Robert Blake, of Waterford, N. Y., for Improvement in Pumps :

We claim the two pistons operating in one cylinder by means of the two piston rods, one passing through the other, combined with and operated by the double crank, in the manner and for the purpose set forth.

35,080.—Gardner Chilson, of Boston, Mass., for Improvement in Dampers :

I claim the arrangement and combination, substantially in the manner as described, of a perforated annular air valve, G, and its seat, B, with a damper, D, and a smoke pipe, A, containing such damper.

I also claim the combination and arrangement of an annular current guard, C, with a perforated damper and an air register arranged with respect to a pipe or smoke conductor, and so as to operate substantially as specified.

35,081.—Orlando Clarke and Isaac Utter, of Rockford, Ill., for Improved Evaporator for Saccharine Juices :

We claim forming depressions, f, in the inclined rails, F, as described, for the purpose of tilting the pans and holding them in that position.

We also claim the combination of the racks on the rails, F, with the pinions on the pan, E, when operating in the manner described for the purpose set forth.

We also claim the combination of the pans, E E', the gearing for moving them, and the inclined rails, F, with the fire place, B, when the whole are constructed, arranged and operated substantially in the manner described for the purpose set forth.

35,082.—J. M. Cook, of Taunton, Mass., for Improved Signal Mechanism for Locomotive Engines :

I claim the described combination for ringing the bell by steam from the boiler the same consisting in the steam wheel, the lever hammer or striker and the gravitating tripper applied by means and so as to operate together, substantially as specified.

35,083.—James M. Cooper, of Pittsburgh, Pa., for Improvement in Railroad Axles :

I claim, first, The use of a cylinder or longitudinal sections of a cylinder placed in, and nearly filling a space in the male axle, when fastened to the tubular or female axle, for the purpose of connecting together the male and female axles, substantially as described.

Second, The use of a flanged head at the extremity of the male axle, either solid therewith, or attached thereto, in combination with the cylinders or section of cylinders, attached to the tubular part of the female axle for the purposes set forth.

Third, The use of an elastic pad inside the female axle or between the solid ends of the two semi-axles, for the purpose of allowing the axles to yield slightly to lateral pressure in running curves or tracks of narrow gage.

Fourth, The use of a loose disk of brass or other metal placed at the extremity of the male axle, whether the elastic pad be used or not, to render the motion of the axles more easy during any lateral pressure thereon.

35,084.—Horace Daniels, of Pawtucket, R. I., for Improvement in Machinery for Dressing Sewing Thread :

I claim, first, In combination with a revolving brush cylinder, a series of lifting or carrying rolls which turn with said cylinder, but may turn on their own axes independent of the motion of the cylinder, of which they are a part, substantially as described.

I also claim the so arranging the brush cylinder with regard to a hot-air chamber, as that whilst it shall revolve partially in or through said air chamber, and partially in or through the surrounding air, the regulating slides, o p, may govern or regulate the hot air admitted to both portions, substantially as and for the purpose described.

35,085.—Joseph Davenport, of Massillon, Ohio, for Improvement in Springs for Vehicles :

I claim a vehicle spring made up of pairs of short sections of leaves, a a, arranged around a common center and radiating therefrom and clamped between two disks at their inner ends and riveted or clamped together at their outer ends, all substantially in the manner and for the purpose described.

35,086.—F. Denzler, of New York City, for Improvement in Toy Breech-loading Firearm :

I claim the described movable breech piece when said breech piece is held in its place by a bayonet joint, and is removed out of the breech for the purpose of receiving the charge and the percussion cap after each discharge of the gun.

35,087.—J. R. Dikeman and J. J. Hewlett, of Hempstead, N. Y., for Improvement in Machines for Marking and Furrowing Land :

I claim the combination of a reel or revolving marker with shares or teeth, J, attached or applied to a frame mounted on wheels and arranged to operate substantially as and for the purpose set forth.

35,088—J. B. Eads, of St. Louis, Mo., for Improved Turret for War Vessels :

I claim making the turret, tower, or shield, F, that protects the wheel, a protection also to the pilot and lookout, one or both, substantially in the manner and for the purpose set forth.

35,089.—Isaac Edge, of Jersey City, N. J., and C. C. Hyde, of Stonington, Conn., for Improved Mode of Firing Night Signals :

We claim the described improvement in firing night signals, by means of the fulminate couch, a, fired by the self-acting rod, c, actuated by springs, f and g, and the piston, d, and the annular plate, h, through the agency of the button, e, the slot, i, and the socket, b, substantially as described.

35,090.—Jonas Farnsworth, of Lewiston, Maine, for Improved Window Washer :

I claim the combination and arrangement of the piston, A, the cylinder, B, the head, D, with sponge, E, and rubber, F, substantially as and for the purpose specified.

35,091.—Henry Fletcher, of London, England, for Improvement in Crinoline Clips :

I claim a crinoline clip with slots or holes therein for passing the suspenders through and connecting the expanders thereto, substantially as described

35,092.—E. H. Funk, of Newark, Ohio, for Improved Evaporator for Saccharine Juices :

I claim the construction and arrangement of the pans or kettles, G J J, with relation to the furnace and to each other, for the purpose of evaporating and clarifying and converting into molasses the juice of sorghum, as described and represented, and these I claim, whether the pan, K, be used in connection with them or not, as set forth.

35,093.—Lucian Gabel, of Richmond, Ind., for Improvement in Combined Sword and Pistol :

I claim the arrangement of a pistol and sword so as to be used jointly or separately, in the manner fully set forth and described.

35,094.—A. J. Gove, of San Francisco, Cal., for Improvement in Faucets :

I claim the combination of the hollow-truncated cones, A and B, and nozzle, D, the whole being constructed, arranged and operated in the manner substantially as specified, and for the purpose set forth.

35,095.—J. S. Hall, of Pittsburgh, Pa., Improvement in Breech-Loading Ordnance :

I claim, in combination with the conical opening in the breech of a cannon, the vertical conical plug, or breech block, operating therein, substantially as described.

I also claim, in combination with the conical breech, and plug or block, the hole, m, in the former, and the opening, b, in the latter, for inserting and ramming home the cartridge, substantially as described.

35,096.—S. T. Holly, of Rockford, Ill., for Improvement in Harvesters :

I claim the arrangement of the guides of the rake carriage at an acute angle with the line of progression of the machine, so as to carry the rake further from the divider side of the machine, as it is moved backward on the guides, substantially as set forth.

I also claim the combination of inclined guides for the rake carriage substantially as set forth, with mechanism for moving the rake teeth forward in a line parallel, or thereabouts, with the line of progression of the machine, substantially as set forth.

I also claim the combination of quadrilateral rack of a rake mechanism with the frame in which it moves, by means of a pair of crossed levers, substantially as set forth.

I also claim the combination of a crank handle for operating the pinion of the raising and lowering mechanism of the cutter bar with a spring bolt and circular nosing, substantially as set forth.

35,097.—Alfred Ingalls, of Independence, Iowa, for Improvement in Machines for Upsetting Tires:

I claim, first, The cams, f f, in combination with the jaws, D D, at

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tached to the bars, A A′, and arranged in relation with the jaws, to operate as and for the purpose specified.

Second, The key, H, when used in connection with the bars, A A′, jaws, D D, cams, f f, stock, C, and cam, F, as and for the purpose set forth.

[This invention consists in the employment or use of a stationary and movable jaw fitted to a segment stock and used in connection with a cam and lever, key and bearing plate, whereby tires for wheels may be readily shrunk or upset and contracted to suit the wheels without being cut and rewelded.]

35,098.—Ross Johnson, of Frederick, Md., for Improvement in Plows:

First, I claim a solid or unbroken-faced moldboard, having a friction roller, e, or rollers, e and e′, of continuous unbroken working face, and so secured centrally and longitudinally in the working face of the moldboard, that said roller or rollers shall present a flush bearing to the furrow slice as it rises upon, passes over and falls away from the moldboard, in the manner and for the purpose specified.

Second, I claim the auxiliary-turning roller, e″, in combination with the friction rollers, e and e′, and moldboard, b, in the manner and for the purpose set forth.

Third, I claim the rotary cutter, h, in combination with the plow point, F, extension, g, thereof, and moldboard, b, in the manner and for the purpose specified.

Fourth, I claim the steady roller, G, in combination with the land side, a, moldboard, b, plow point, F, and cutter, h, in the manner and for the purpose set forth.

35,099.—G. W. Lemley, of Pavilion, N. Y., for Improvement in Machines for Boring Seats of Buggies:

I claim a machine for boring the corner holes in buggy seats, and articles of a like nature, consisting of a combination of proper means for regulating and determining the point where and the angle at which the said holes are to be bored, substantially as described.

I also claim a machine which possesses the capacity of regulating and determing the place and angle of the corner holes, as well as proper means for determining the bevel of the posts in their cross section for that angle, substantially as set forth.

I further claim a machine which possesses the capacity of regulating and determining the place and angle of the corner holes, as well as proper means for determining the bevel or miter of the shoulders of the tenons on the posts for that angle, as described.

I also claim a machine comprising proper means for laying out or determining all the bevels of the posts of carriage seats, &c., to fit them to any desired angle of corner or post hole, as set forth.

And, finally, I claim a machine consisting of a combination of proper means to bore the corner or post holes of a carriage seat, &c., at any desired angle, and to determine or indicate the bevel of the posts in their cross section, and the bevel or miter of the shoulders of the tenons thereon, for that particular angle or corner or post hole, as specified.

35,100.—R. O. Lowrey, of Saratoga Springs, N. Y., for Improvement in Wind Mills:

I claim, first, The arms, H, with termini of the construction described, in combination with the hinging brackets, J, of the wings or blades, I, substantially as set forth.

Second, In combination with the arms, H, and brackets, J, I claim the levers, K, rollers, h, stops, i, cords, L, and ring weight, C, substantially in the manner and for the purpose described.

Third, The arrangement of a sliding ring weight, constructed as described, in combination with the vertical shaft, A, blades, I, and clutch lever, D, substantially as and for the purposes set forth.

35,101.—J. Luccock and J. M. L. Gowdy, of Peoria, Ill., for Improvement in Churns:

We claim the combination of the rotary dashers, C C′ C″, of unequal lengths with the racks or breakers, D, when constructed, arranged and operating as described for the purpose set forth.

35,102.—W. J. Lyman, of East Hampton, and A. E. Lyman, of Williamsburg, Mass., for Improvement in Coffins:

We claim the improved coffin, substantially as described, as a new article of manufacture.

35,103.—William Mansfield, Jedediah Morse and H. H. Mansfield, of Canton, Mass., for Improvement in Projectiles for Ordnance, &c.:

We claim, first, The spiral air passages, c c, formed between two cones, B b, and combining with a central air passage, a, substantially as and for the purpose specified.

Second, The combination of the external conical surface, f, forming the exterior of a hollow cone and and the shoulder, g, substantially as and for the purpose specified.

[One object of this invention is to obtain a rotary motion of an elongated projectile about its axis, by the action of the atmosphere upon it, when discharged from a smooth-bore gun, and to this end a part of the invention consists in providing in the rear of the projectile two or more spiral air passages formed between the cones, and communicating with a central passage in the front part of the projectile. Another object is to insure the projectile striking on its point, and to this end another part of the invention consists in making the rear portion of the exterior of the projectile of conical form, externally as well as internally, the exterior surface of such conical portion being in the rear of a shoulder, over which, in the flight of the projectile, the air rushes against the said surface on all sides thereof.]

35,104.—Enoch Osgood, of Boston, Mass., for Improved Regulator Valve for Air, Gas, &c.:

I claim the combination of a valve and a diaphragm enough larger than the valve to give it any desired power over it, wanted to close it, to hold and balance any pressure that may come in between them to be weighed out by weights on the diaphragm, to give the desired pressure wanted in the chamber below the valve for use, constructed and connected together to operate against each other, substantially as and for the purpose described.

35,105.—Gordon McKay, of Boston, Mass., for Improvement in Boots and Shoes:

I claim the formation of a quilting seam or seams within those used for holding the vamp, said quilting being formed of chain or tambour stitches passing through the whole thickness of the sole, substantially as and for the purposes set forth.

35,106.—S. H. Noble, of Vernon Springs, Iowa, for Improvement in Sled and Sleigh Runners:

I claim, as a new article of manufacture, a sled or sleigh runner formed of a cast-iron crook, B, with or without the shoe, C, and a straight wooden portion, A, combined or put together, substantially as shown and described.

[This invention consists in constructing a sled or sleigh runner of cast metal and wood combined, in such a manner that a straight piece of wood may be used for the main portion of the runner, and the cast metal for the crook or curve, and also the shoe of the wood portion.]

35,107.—J. P. Marshal, of Millbury, Mass., for Improvement in Breech-Loading Firearms:

I claim, first, The combination of the peculiarly-constructed stationary breech, C, with the movable breech, D E, arranged for conjoint operation in the manner and for the purpose specified.

Second, The combination of the operating lever, H, and movable breech, with the lock bolt, J, and trigger, P, substantially as and for the purpose described.

Third, The combination of the breech pin, X, constructed as described, with the screw, G, plate, E, and cylinder, D, arranged and operating as and for the purpose set forth.

Fourth, Forming the cone seat and its shield of the same piece with the lock plate, in the manner and for the purpose set forth.

Fifth, Forming a circular flange around the vent of the stationary breech piece to fit into a cavity, or recess, of corresponding size, in the rear side of the cone shield, in the manner and for the purpose described.

35,108.—H. H. Palmer, of Rockford, Ill., for Improvement in Pumps:

I claim the combination of the water chamber, H, with the suspension rod, K, when arranged and operating as described for the purpose set forth.

I also claim suspending the water chamber from the platform, A, by means of the rods, J and K, and guide ring, I, as and for the purpose described.

I also claim the combination of the flanged standard, B, air vessel, C, piston tube, F, piston, G, and water chamber, H, when the whole are arranged for joint operation, substantially in the manner described.

35,109.—John Percy, of Albany, N. Y., for Improvement in Machinery for Ginning Cotton:

I claim the construction of a picker for a cotton gin consisting of a hollow revolving cylinder, D, having through its outer periphery slots or openings for the passage thorough them of teeth, j j, affixed to rods which oscillate in bearings placed near the outer periphery of a pair of disks, E, located within the cylinder; these disks being arranged to revolve simultaneously with the cylinder, D, on an axis eccentric to its axis, so as to cause the said teeth to vibrate back and forth through the slots, substantially in the manner and for the purpose set forth.

35,110.—H. C. Pierce, of Homer, N. Y., Improvement in Churns:

I claim, first, The arrangement of the eccentric lever, L, spring catch, M, and ratchet plate, N, in combination with the wheel, K, pinions, C and F, disk, D, and dasher shaft, B, substantially as an for the purpose described.

Second, I also claim the employment of the wings, G, in combination with the disk, D, and holes, H H, substantially as and for the purpose set forth.

Third, I also claim the employment of the plate, I, or its equivalent, in combination with the disk, D, wings, G, and holes, H, for the purpose of controlling the admission of air, to the interior of the churn, substantially as set forth.

35,111.—L. B. Prindle, of Litchfield, Conn., for Improvement in Cups for Elevators of Flouring Mills:

I claim, as a new article of manufacture and sale, making elevating cups of malleable cast iron, for the purposes set forth.

35,112.—Gelston Sanford, of New York City, for Improvement in Head Rests for Car Seats:

I claim an adjustable portable rest for the head, to be attached to the back of a car seat, and so arranged that it can be folded together so as to occupy less space when not in use, substantially as specified.

35,113.—Isaac Sherwood, of Unadilla, N. Y., for Improvement in Water Elevators:

I claim, first, A water elevator, having, in combination, the wheels, D and D2 and E, constructed and operating substantially as described

Second, In combination therewith the double-acting lever, G and G2 H K K2, constructed and operating substantially as described.

35,114.—Isaac Stead, of Philadelphia, Pa., for Improvement in Condensing Carding Engines:

I claim, first, The revolving-toothed cylinder, I, in combination with the doffing cylinder, B, of a condensing carding engine, as forming a fiber separator, as described.

Second, I claim the stripper, S, in combination with the revolving-toothed cylinder, I, for the purpose of removing the fibers which may collect on the teeth, and carrying them back to the main cylinder, as described in specification.

35,115.—E. M. Stevens, of Boston, Mass., for Improved Clothes Wringer:

I claim, first, The jointed levers, F F, provided with thumb screws, h h, substantially as set forth and for the objects specified.

Second, Making the core, W, of the rolls fluted, and fitting into the flutes, cylinders of rubber, r, surrounded by a rubber tubing, R, substantially as and for the objects specified.

Third, The combination and arrangement of the lever, K, self-adjusting foot, N, and thumb screw, M, substantially as described and for the objects specified.

35,116.—A. Steward, of Plano, Ill., for Improvement in Stationary Counter Scissors:

I claim stationary scissors, hung and operated substantially as described.

I claim, also, in combination therewith, a measure so arranged that the cutting blades shall operate at one extremity thereof, as described.

35,117.—N. W. Taylor and J. W. Brightman, of Cleveland, Ohio, for Improvement in Machines for Drying Sized Paper:

We claim, first, The described construction of a drier, consisting of an inclosed chamber, provided with suitable openings, for the purposes specified, and which can be closed at pleasure, and having within said chamber the bearing rollers placed in horizontal rows, and the successive sets so arranged in relation to each other and the points of introduction for the paper and the heated air, that the paper will pass continually from a moist to a dry and heated atmosphere, as and for the purpose specified.

Second, We claim moving the rollers, S M N O P, at decreasing velocities, for the purpose set forth.

Third, We claim the plates, R, and openings, a′ b′, arranged as and for the purpose described.

35,118.—Thomas Tripp, of Amsterdam, N. Y, for Improved Water Wheels:

I claim, first, The conic form or shape of the center of this wheel, as applied to water wheels.

Second, The extension of the lower middle point of the main buckets, C C, Fig. 1, at the point 1, so as to receive the inclined auxiliary buckets, as represented.

Third, The curvature of the inner bottom edges of the main buckets, as represented in Fig. 1 by the red dotted lines.

Fourth, The curved and V-like shape of the inclined auxiliary buckets to water wheels, as represented by b b b b, Fig. 2.

Fifth, The scallop or concave of the lower edges of the bottom of the inclined auxiliary buckets, as applied to water wheels—the different curves of the parts of the wheel being arcs of the same circle as the circumference of the entire wheel.

Sixth, Inclined-curved auxiliary buckets, attached to curved or concavo-convex main buckets, conforming to the curvature of said main buckets.

35,119.—George Turner, of Cambridge, Ohio, for Improvement in Corn Shellers:

I claim the tapering cylinder, D, with teeth further apart on the large end, and closer together as they approach the small end, so arranged and operated that the ear of corn shall first be received at the large end of said cylinder, and pass toward the small end in process of being shelled, in combination with the springs, E and F, and inclined plane, G, in the manner and for the purposes set forth.

35,120.—Amos Westcott, of Syracuse, N. Y., for Improvement in Churns:

I claim the combination of the plano-diagonal dasher paddles, Fig. 7, A and B, with the box, Fig. 4, and with the shaft, A A, Fig. 5, when these paddles are set in such a manner about the shaft, Figs. 5 and 6, as that when the shaft is turned in such direction as to make the diagonal faces of the paddles strike the cream or milk, their effect will be to force the particles of butter, whether large or small, which may be floating in the fluid, toward a vertical plane in the box of the churn, parallel to its ends.

I also claim the employment of the fan wheel, Figs. 3 and 4, constructed essentially as and for the purposes set forth, in combination with the other parts of the churn, as described.

34,121.—D. H. Whittemore, of Worcester, Mass., for Improvement in Straw Cutters:

I claim, first, So arranging two cylinders together that the periphery of one shall move faster than that of the other, and at some point between them the knife or knives upon one shall move past the knife or knives, or projections upon the other cylinder, in such a manner that both a shear cut and self-feeding operation shall be produced thereby.

Second, I claim arranging two cylinders together, in such a manner that their relative position with the feed in the hopper can be changed for the purpose of varying the length of the feed cut, or so placing them upon the frame that the line of center of the two cylinders will not be at right angles with the bottom of the hopper, as represented in the drawings, for the purpose of producing a short cut, substantially as set forth.

Third, I claim combining with said share-cutting cylinders the movable mouth piece, L, substantially in the manner and for the purpose set forth.

35,122.—I. A Williams, of Utica, N. Y., for Improvement in Locomotive Lamps

I claim the perforated cylinders, E F, one or more, in combination with the cap or deflector, G, and hollow wick tube, C, arranged substantially as and for the purpose specified.

I further claim the perforated cylinders, E F, one or more, cap or deflector, G, perforated hollow base, K, provided with the perforated cap, L, in combination with the hollow cylindrical wick tube, C, all arranged for joint operation, substantially as and for the purpose set forth.

35,123.—Lorenzo Winslow, of Rochester, New York, for Improved Wrench:

I claim the arrangement within the jaw, B, of the dog, d, and spring, S, in relation to the notched shank, A, the whole operating in the manner and for the purpose, substantially as set forth.

35,124.—D. T. Yeakel, of Lafayette, Ind., for Improvement in Mode of Constructing Ordnance:

I claim the use of plate or sheet iron or steel, in the manufacture or construction of large iron or steel cylinders, by winding the plate or sheet iron or steel (the plate or sheet being in width equal to the desired length of the cylinder) around a central mandrel, until by repeated continuous layers the intended size is produced, and after the first layer around the central mandrel (which may or may not be wedded to the mandrel) each part of the plate, or sheet of iron or steel so wound to be welded to the part immediately under it.

[An engraving of this invention will appear in our next number.]

35,125.—D. C. Lawrence, of Cedar Falls, Iowa, for Improvement in Spring Balances:

I claim a spring balance, made of a single piece of wire, substantially in the manner and for the purpose set forth.

35,126.—E. L. Pratt, of Philadelphia, Pa., assignor to J. B. Collin, of Boston, Mass., for Improvement in the Thread Tension of Sewing Machines:

I claim so combining and arranging the tension devices which operate upon the threads used in a sewing machine which makes the double chain or Grover & Baker stitch that a relative, or any desired relative proportion of the whole tension upon the threads is made to be automatically operative upon each thread, and so maintained when the total tension on the threads is increased or diminished, said arrangement and combination being such that changes in the amount of the tension may be made with facility, substantially as described.

35,127.—Coleman Sellers (assignor to William Sellers & Co.), of Philadelphia, Pa., for Improvement in Wheel Press:

I claim the use of an adjustable upright, H, or its equivalent, substantially in the manner and for the purpose specified.

The hinged attachment of the blocking piece, N, or its equivalent, to the forcing-up plunger, substantially in the manner and for the purpose specified.

35,128.—Thomas Shaw, of Philadelphia, Pa., assignor to himself and Philip S. Justice, for Improvement in Laying Telegraphic Cables.

I claim the partial supporting of the telegraphic cable, while paying out, by means of an additional cable, when connected with friction clutches, as described.

35,129.—H. D. Stover of New York City, and W. W. W. Wood, of Philadelphia, Pa., assignor to said H. D. Stover, for Improved Shutters for the Portholes of Vessels, &c.:

We claim, first, The construction and arrangement of shields or armor to the portholes of war vessels or floating batteries, substantially as shown and described, by forming two or more plane or curved plates, impenetrable to shot, and arranged at such angles in relation to each other, and to the side walls of said vessel or battery, as to insure the glancing off of the projectiles thrown upon or against them, as set forth.

Second, In combination with movable shields, operating as described, we claim the convex-shaped or angular blocks, arranged to close the top opening between the shields and side walls, and to hold the said shields, when closed, at their requisite angles, substantially as shown and described.

Third, In combination with such movable shields, closing automatically or otherwise, in the manner described, we claim so forming corresponding recesses to the inner edges of the shields, as that the shields, by closing against the gun, shall leave a vertical space, sufficiently narrow to prevent projectiles from penetrating, yet wide enough to allow of the gun being sighted through it.

35,130.—Samuel Vanstone, of Providence, R. I., assignor to Wm. P. Pierce, of Boston, Mass., for Improvement in Machines for Cutting Files:

I claim the two disk cylinders, operating simultaneously upon the two sides of the blank, in combination with the peculiar construction of the disk cylinders, substantially as described, for the purpose specified.

35,131.—J. H. and A. E. Redstone (assignor to themselves and James M. Ray), of Indianapolis, Ind., for Improvement for Changing a Rotary into a Reciprocating Motion:

We claim the combination, in the manner described, of the groove, C, slot, D, and slide, A, when operated, substantially as set forth.

RE-ISSUES.

1,304.—J. E. Emerson, of Trenton, N. J., for Improvement in Mode of Fastening Tools to their Handles. Patented March 29, 1859.

I claim, first, The use of picks, axes, or other analogous tools without eyes therein, when the same are fastened to a handle by means of a stirrup, an iron heading, a gib and key or wedge.

Second, I claim the iron heading of a handle, in combination with the transverse key or wedge, and the eyeless pick, ax, or other analogous tool.

Third, I claim the key or wedge, when the same is used transversely to the tool for attaching picks, axes, or other analogous tools to handles.

1,305.—S. S. White, of Philadelphia, Pa., for Improvement in the Manufacture of Artificial Teeth. Patented January 1, 1862.

I claim the manufacture of mineral teeth, with pins having heads, d d, at their outer ends, substantially as specified.

DESIGNS.

1,568.—C. H. Frost, of Peekskill, N. Y., for Design for a Cook's Stove.

1,569.—W. H. Green and P. J. Clark (assignor to S. S. Clark) of Meriden, Conn., for Design for a Chandelier,

1,570.—N. P. Maker, of Pawtucket, R. I., for Design for a Crucifix.

1,571.—J. B. Sargent, of New Britain, Conn., for Design for a Coffin Handle.

TO OUR READERS.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on Design Patents when two good drawings are all that is required to accompany petition, specification and oath, except the government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO.,
No. 37 Park-row, New York.

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PATENTS FOR SEVENTEEN YEARS.

The new Patent Laws enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from $30 down to $15. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for Design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN ; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time and on the most liberal terms.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. More than 5,000 such examinations have been made through this office during the past three years. Address MUNN & CO., No. 37 Park-row, N. Y.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention. If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fees by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats, in English and German, furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

Circulars of information concerning the proper course to be pursued obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principle office, No. 37 Park-row, New York; or either Branch Offices.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

Notes and Queries

F. G. & B. P., of N. B.—Messrs. Sellers, of Philadelphia, are agents for and manufacturers of Giffard's boiler injectors. For the information you desire respecting T. Hunt's modification of the injector, illustrated on page 184, Vol. V. (new series) SCIENTIFIC AMERICAN, you must address the inventor, at Crewe, England.

H. S. S., of Mass.—The metal magnesium is costly because the processes for obtaining it from its natural salts are tedious and expensive. Perennial cotton is not considered equal to the annual. Percussion shells are now cast with a portion of each heavier than the rest so as to insure its striking on the heavy side, otherwise there can be no certainty respecting their explosion.

J. M. L., of Mass.—The "Tinman's Manual" is published by I. R. Butts & Co., Boston.

O. P., of N. Y.—The salts of tin, as you suppose, are crystals of the protochloride of tin. Cast iron should be malleablized before it is galvanized or tinned. We have been informed that it is coated with zinc before a thick coat of tin is put upon it, and *vice versa*. You will find it too expensive to employ the galvanic process for tinning, or zincking cast iron.

D. C., of C. W.—Electro platers make their own wire brushes with fine brush wire. The high polish of electro-plated goods is given with steel and agate burnishers.

T. B., of Phila.—We have been informed that Capt. Gowan, of your city, is the American contractor who is raising the sunken vessels of Sevastopol. You probably can find some information respecting him personally at the Franklin Institute. We understand he uses the diving bell for submarine operations, stops all the leaks and boards up each vessel to exclude the water from the cradle thus formed, then he pumps out the water from the vessel until she floats.

G. M. G., of N. Y.—The "tuns burthen" of a vessel does not mean, as the term is commonly used, the amount of freight which a vessel can carry, but refers to the measurement of the vessel. A vessel registered for 1,200 tuns may be able to carry 2,000 tuns.

C. D. L., of N. Y.—Prof. Rankine, has published a manual of the steam engine, in which he gives formulae for calculating the amount of steam which should be condensed when working expansively independent of the surface condensation by conduction of the heat.

O. C. H., of Conn.—All paper becomes yellow in color by long exposure to the atmosphere. This may be caused by the absorption of smoke, dirt and acid from the atmosphere. By scouring iron bright and dipping it into a strong solution of the sulphate of copper a thin skin of pure copper will be deposited, but it soon wears off. You cannot deposit a thick coat without using a battery.

J. H. C., of Mass.—The best way to dissolve isinglass is to allow it to stand all night in a vessel containing cold water, then put it on the fire next morning and stir it until it becomes hot.

R. B. P., of Conn.—A breast wheel of 30 feet diameter supplied with 72·4 cubic feet of water per second is 164.44 horse power. Are you sure that you have such a great quantity of water flowing into your wheel

E. J. P., of Pa.—You will find an Engraving of Giffard's Injector in Vol. III. SCIENTIFIC AMERICAN (new series) page 260. You will find mention made of it in Vol. IV. pages 4 and 375.

E. Piper, of Camden, Me., wishes to know where glass cylinders sufficiently perfect for air pumps, of green glass, can be obtained.

A. M. Swain, of North Chelmsford, Mass., desires to correspond with G. W. W., of N. Y., P. H. W., of Me., J. F. C., of Mich., J. K. W., of Kansas, and a reader of the SCIENTIFIC AMERICAN, Pa. These parties will please address as above.

M. J. W., of N. Y.—You have no right to manufacture a patented machine in any county where the "right" is owned by another person, even if you do not offer the manufactured article for sale

C. E. W., of Ky., J. H. S. and R. W., of Ohio.—Your plans for armor plates for vessels are received. It is said that the Navy Department has received over 1,500 of these plans, and when the best are selected we shall probably give illustrations of them. In the mean time unless something very novel and promising should be presented, we shall fill our pages with other matter

C. A. W., of Mo.—The power that forces water up the short leg of a siphon is the weight of air resting upon the surface of the reservoir from which the water flows; consequently the wate will rise to such hight that its vertical column will be equal in weight to a vertical column of the atmosphere of the same size. This at the level of the sea is a little less than 34 feet, but varies with the changes in the atmosphere. It rapidly diminishes as the altitude above the sea increases.

T. M., of N. Y.—The American Pneumatic system for carrying mails, &c. through exhausted tubes is illustrated and described on page 265, Vol. VIII. (old series) SCIENTIFIC AMERICAN. By consulting these illustrated descriptions of the pneumatic post system, you will obtain very full information on the subject.

V. B., of Pa.—The most perfect method of preventing alcohol from evaporating from bottles and glass vessels containing preserved insects, reptiles, &c , is to use ground glass stoppers, and fuse some glass with the blow pipe around the seams. Sealing wax is the best plastic substance known to us for sealing such glass vessels, but it is slightly porous, and alcoholic vapor will slowly escape from vessels coated with it.

J. D., of Mass.—We saw the report published that the Parrott gun had sent a newly invented shot completely through a target formed of 12 one-inch iron plates and a backing of 24 inches thickness of oak, at a distance of 300 yards. Also that another target at the same distance sloped to an angle of 25° representing the side of the *Merrimac*, backed by 24 inches of oak and covered with six one-inch iron plates, was completely perforated by every shot. We do not know how far these statements are true as there has not yet appeared any verification of them. This result is possible with a projectile of the right weight and velocity.

SPECIAL NOTICE—FOREIGN PATENT.—The population of Great Britain, is 30,000,000; of France, 35,000,000 ; Belgium, 5,000,000, Austria, 40,000,000; Prussia, 20,000,000; and Russia, 60,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. Nearly all of the patents secured in foreign countries by Americans are obtained through our agency. Address Munn & Co., 37 Park row, New York. Circulars about foreign patents furnished free.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, May 7, 1862:—

W. B., of N. Y., $40; F. W., of N. J., $15; S. A. B., of R. I., $20; J. K., of N. Y., $45; W. D. A., of N. Y., $40; H. R., of Ill., $20; S. E. A., of N. Y., $45; J. J. A., of Mich., $20; S. E. S., of N. Y., $20; W. B., of N. Y., $10; L. S. A., of Ind., $10; H. C., of O., $15; J. E., of N. J., $30; J. M., of Pa., $25; J. A. B., of Mass., $15; S. and F., of Pa., $25; G. R. R., of Ill., $15; P. and S., of N. Y., $15; H. W., of Vt., $20; M. V., of N. Y., $20; W. H. G., of N. Y., $40; W. L. F., of N. J., $55; W. H. E., of Va., $20; P. and B., of Mass., $20; T. C. B., of Vt., $45; N. F. E., of Vt., $20; J. A., of N. Y., $45; R. B., of N. Y., $15; G. T., of Conn., $25; T. H. R., of Mass., $30; C. and M., of Iowa, $25; R. D. D., of Iowa, $25; M. G., of Pa., $15; J. S., of Mass., $25; H. M., of N. H., $75; J. M. W., of Iowa, $25; E. D. G., of Conn., $20; R. G., of N. Y., $20; C. H. W., of Mass., $20; J. C. C., of Vt., $20; A. C., of N. Y., $45; C. C. C., of N. Y., $20; H. S. and R., of Vt., $20; G. C., of N. Y., $48; J. S., of N. Y., $20; P. and P., of Ill., $25; G. H., of Ill., $15; D. and R., of Iowa, $15; J. M. D., of N. Y., $15; S. W., of Mass., $25; H. W. G., of Conn., $40; B. and E. H., of Ill., $25; W., H. H. and L. H. McF., of N. Y., $15; J. M. D., of Va., $25; J. D., of Mich., $15; T. and H., of N. Y., $250; B. D., of Conn., $15; J. B. T., of Pa., $34; R. F., Jr., of Mass., $15; R. S., of N. Y., $20; N. A. B., of N. Y., $25; T. and D., of O., $25; E. T. C., of Ind., $15; V. W. B , of Vt., $10; A. G., of N. Y., $15; C. and C., of Va., $15; A. B., of Iowa, $20; C. B., of N. Y., $10; W. W. B., of N. Y., $25; E. M. C., of N. Y., $25; G. A. T., of Wis., $20; E. J. C., of Ill., $15; T. W. C., of N. Y., $25; P. K., of Conn., $35; E. W., of N. Y., $25; W. E. B., of Conn., $15.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from April 30 to Wednesday, May 7, 1862:—

G. C., of N. Y.; W. H. G., of N. Y.; C. J., of N. Y.; J. M. W., of Iowa; J. M. D., of Va.; G. A. T., of Mass.; J. M., of Conn.; W. E. B., of N. J.; L. S. A., of Ind.; C. and M., of Iowa; R. D. D., of Iowa; W. D. A., of N. Y.; F. W., of N. J.; A. F. T., of N. Y.; E. W., of N. Y.; N. A. B., of N. Y.; H. W. O., of Conn.; S. W., of Mass.; J. N., of N. Y.; J. M., of Pa.; P. and P., of Ill.; J. S., of Mass.; W. L. F., of N. J.; W. B., of N. Y.; J. McN., of Pa.; F. W. C., of N. Y.; W. W. B., of N. Y.; R. S., of N. Y.; E. M. C., of N. Y.; B. and E. H., of Ill.; G. T., of Conn.; T. H. R., of Mass.; G. H. F., of N. Y.

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INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, of whatever kind, can have their Inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no secondhand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars, address—

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Publishers SCIENTIFIC AMERICAN,
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Twenty-five Cents per line for each and every insertion, payable in advance. To enable all to understand how to compute the amount they must send in when they wish advertisements inserted, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

THE PATENT SOLAR MATCHES CONTAIN NO SULphur, and are the best burning match yet invented. They are as cheap as sulphur matches, without their offensive smell when burning. For licenses to manufacture, address the SOLAR MATCH COMPANY, Nos. 101 and 103 Beekman street, New York City. 20 4*

NOTICE TO INVENTORS AND MANUFACTURERS. —We are the exclusive owners, under Goodyear's patent, of the rights to manufacture, use and sell Vulcanized India Rubber, "so far as it may or can be used," for rolls and coverings for rolls for washing, wringing and starching machines. We know that the "clothes squeezer" must be a necessity in every family so soon as known, and we desire to encourage other parties in the manufacture of it. We, therfore, license makers of good wringers upon liberal terms, and furnish them promptly with the best of rubber rolls—a large supply of which we keep constantly on hand. All parties infringing our rights will be prosecuted to the extent of the law. Address, METROPOLITAN WASHING MACHINE CO., Middlefield, Conn.
20 tf. DAVID LYMAN, Treas.

UNIVERSAL CLOTHES WRINGER.—WE BELIEVE this to be the most powerful, most durable, and most convenient wringer invented. Agents wanted to canvass towns and counties all over the United States. Address METROPOLITAN WASHING MACHINE COMPANY, Middlefield, Conn. AGENTS, R. C. Browning, No. 2½ Dey street, New York City, and Rubber Clothing Company, No. 37 Milk street, Boston, Mass. 20 tf

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BAG HOLDER AND CONVEYER, TO HOLD BAGS for filling, and wheel them away when full without handling, and for all other purposes for which hand trucks are used. Wanted by every farmer, and all who have bags to fill and handle. Price $5. Agents wanted in every county in the Union, who may manufacture, or can be supplied by me. A chance for mechanics, farmers and others. It is very simple and gives full satisfaction. Address, with letter stamp, J. R. HOFFER, Mount Joy, Lancaster Co., Pa. 20 3eow*

METALS.—THOS. J. POPE, NO. 92 JOHN STREET, New York City.—Charcoal and Anthracite Pig Iron, direct from furnaces, Bar Irons, to order, from mills, Ingot, Copper, Lake, Baltimore, &c., Old Copper, Lead, Tin, Antimony, Cut Nails, Babbit Metal.
20 5*

RUSSELLS'S SELF-RAKER FOR HARVESTERS HAS been thoroughly tested, and is found equal to the best. See illustration in SCIENTIFIC AMERICAN of May 17, 1862. Rights for sale. Address J. S. & H. R. RUSSELLS, New Market, Frederick County, Maryland. 20 3*

COMBINED SHINGLE AND HEADING SAW.—UNEqualed for simplicity and economy of power and timber. Illustrated in No. 20, present volume, SCIENTIFIC AMERICAN. Address TREVOR & CO., Lockport, N. Y. 20 13*

VALUABLE PATENT FOR SALE.—A SMALL, NEW and useful article for every female, that will pay a large profit. See SCIENTIFIC AMERICAN, Vol. VI., No. 9 (new series), and address JOS. LOFVENDAHL, Boston, Mass. 1*

IMPROVED MILLING MACHINES, WITH HAND AND power feed, furnished for $300 per pair, by W. T. NICHOLSON, Providence, R. I. 20 3*

PATENT FOR SALE.—IMPROVED CATCH BOLT FOR Door Locks and Latches, which greatly facilitates their operation, and does not increase the cost of manufacture. Address WM. SALISBURY, Wheeling, Va. 20 5*

FOR SALE.—HALF OF AN ENGLISH PATENT. The inventor would like to meet with some one to join him in introducing a patented article. Will be used extensively in the cloth, cotton, paper, oil and other factures. The invention can be seen in operation, and full particulars obtained by applying to JOHN LEAVENS, No. 82 Washington street, Brooklyn, L. I. 1*

EMPLOYMENT! AGENTS WANTED!! A NEW EN-terprise.—The Franklin Sewing Machine Company want agents, at a salary of $40 per month and expenses paid. For particulars address, with stamp, HARRIS BROTHERS, Box 302 Boston, Mass.
20 tf

C. C. WHITTELSEY, FOUNDRY AND MACHINE Shop, Malone, N. Y.—Manufacturer of Portable and Stationary Steam Engines, Engine and Hand Lathes, Upright Drills, Bolt Cutters, Double and Single-Acting Force and Lifting Pumps, Large Circular Sawmills, Grist and Sawmill Gearing, Shafting and Pulleys of all sizes, Hangers, with adjustable boxes, Bark Mills, with treble run; also, Boring, Tenoning, Molding, Sticking, Tongueing and Grooving Machines, Daniel & Woodworth Planers, Power and Foot-Morticing Machines, Spoke Lathes, Shingle, Long and Short Clapboard Machines. All kinds of castings made to order. 1

AGENTS WANTED TO SELL PARSON BROWNLOW'S Wonderful Book.—Apply to GEORGE W. CHILDS, Publisher, Nos. 628 and 630 Chestnut street, Philadelphia. Applegate & Co., Cincinnati, Publishers for the West. 19 2*

SPRING TACKLE BLOCKS.—PATENT RIGHT FOR Sale, or license to manufacture granted on reasonable terms. See invention described in SCIENTIFIC AMERICAN for May 10, 1862. Address Mrs. EUNICE B. HUSSEY, Baltimore, Md. 19 7*

TERRYVILLE CLOCK SPRING COMPANY.—MANUfacturers of Polished Clock, Watch and Toy Springs, Terryville, Conn. 19 26*

A PRACTICAL MACHINIST AND ENGINEER SEEKS employment.—Would become an agent for the sale of some invention of real utility. The most satisfactory reference will be given. Only those willing to deal liberally with a thoroughly reliable man, may address CONDENSER, Box No. 131, Phelps, Ontario County, New York. 18 4*

BAIRD'S PATENT PREPARATION FOR THE PROtection of Steam Boilers from Incrustation.—It does not injure the metals; is a great saving of fuel; does not foam, and works equally well in salt and fresh water. For sale by JAMES F. LEVIN, No. 23 Cent l Wharf, Boston, Mass. New York depot, COLES & CO., No. 91 West street. 18tf

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JACQUARD MACHINES, WITH APPURTENANCES, manufactured and put up. Looms for narrow goods, from silk ribbon to cotton tape, built to order on the most approved principles. W. P. UHLINGER, No. 1,621 North Second street, Philadelphia, Pa.
17 5*

MACHINIST'S TOOLS.—SECOND-HAND LATHES, Planers, drilling machines and shop cranes. Apply to C. W. COPELAND, No. 122 Broadway, New York City. 17 4

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CENTRIFUGAL SUGAR MACHINES—MESSRS. ASpinwall & Woolsey's patent.—George B. Hartson, No. 111 East Forty-second street, continues to execute orders, and gives his personal attention to the erection of the above machines, and will also furnish plans and esumates for complete sugar refineries, with all the atest improvements. 22 6m*

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Improved Shingle and Heading Machine.

The accompanying engraving represents a machine which will saw either shingles or headings, cutting the timber with the grain, and thus materially obviating the objection which is brought against sawed shingles.

The bolt or block being placed on end upon a sort of shelf at the bottom of the swing, at *d*, is fastened by bringing the dog, D, down upon it by means of the handle, N. Continuing to push upon the handle, N, the swing carrying the bolt is vibrated past the saw and a slab piece cut off; returning, the dog is raised, and with the left hand the bolt is pushed against the gage, M, which determines the thickness and shape of the shingle; the dog is again brought down and the operation repeated. The saw, when properly filed, draws the bolt forward almost without effort on the part of the sawyer, and a small weight attached by a chain or cord to the swing, and passing over the sheave in the end of the slide, at *e*, assists in returning it.

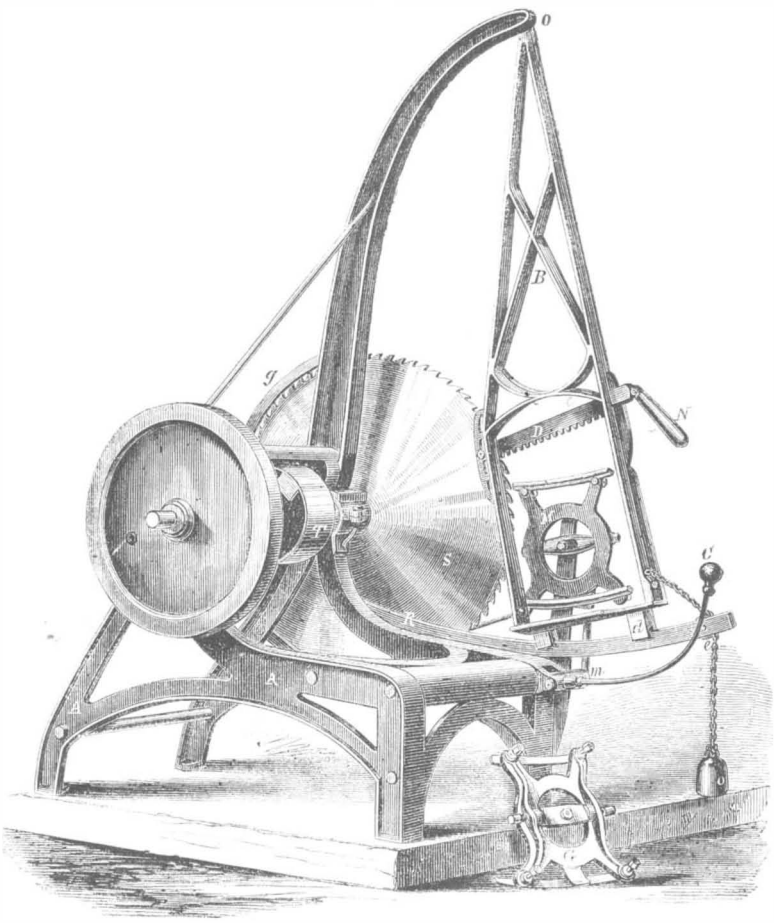
The gage, M, is vibrated to cut shingles, alternately points up and down, by the handle, C, placed conveniently for use by the left hand, while the right is pushing the swing forward and returning it. When sawing heading the gage remains stationary. The thickness and shape of the shingles are altered in any degree necessary by set screws in the gage, M, which is more distinctly shown, detached and turned round at G.

The change from shingles to heading is made without the addition or removal of any part, by a simple adjustment of set screws. The frame, A A, is of cast iron, thoroughly bolted and braced. At its highest point, O, is a wrist, upon which is hung the swing, B, which is guided in its vibrations toward and from the saw, S, by the slide, R, without, however, resting upon it.

The manufacturers of these machines say the arbor upon which is the saw, S, pulley, T, and balance wheel, E, is of cast steel, finished in the best manner, and supported in babbetted boxes of long bearing, firmly bolted to the frame. The pulley, if desired, can be placed outside of the flywheel. The saw is supported and stiffened by a collar on the outside not shown. The guard, G, with an arrangement below, not shown, for separating the shingles and saw dust, renders it perfectly safe to the operator.

The saws are made to order, and ground down to No. 16 gage, thus consuming but little power and effecting a great saving of timber. The sawdust being in long fibers burns rapidly, so that with a good boiler the dust will furnish steam enough to run the machine if cutting pine. The power is not consumed in the operation of small contrivances, which are always getting out of order, but is applied directly to the work.

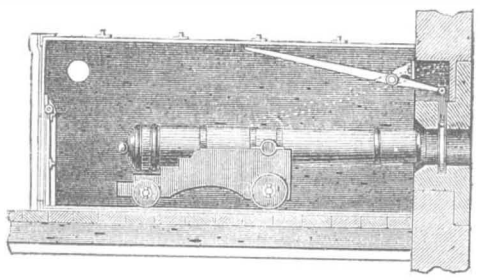
The patent for this invention was granted through the Scientific American Patent Agency, to the inventor, Robert Law, of Portage City, Wis., January 5, 1858, and further information in relation to it may be obtained by addressing the manufacturers of the machines, Trevor & Co., at Lockport, N. Y., to whom the patent has been assigned. [See advertisement on another page.]



TREVOR & CO.'S COMBINED SHINGLE AND HEADING MACHINE.

SUBMARINE GUNS.

As the part of a war vessel most dangerous to be struck is under the water line, several plans have been proposed for guns to fire under the water into the hull of an enemy's vessel when ranged alongside The accompanying engraving represents a gun proposed to be operated for this purpose, by Thomas Page, C. E., London, and described in the *Mechanics' Magazine*.



Each gun is to be placed in a chamber below the water level. This chamber is made watertight, and air is forced into it by a pump through a tube. The air pressure is greater than that of the water at the depth at which the gun is placed below the water level. Each gun chamber is connected with a reservoir in which a plentiful supply of condensed air is maintained. The gun being loaded, placed and trained in position by suitable apparatus, a port is opened in the ship'sside below the water level, and the gun is fired through such port, which is again immediately closed. The pressure of air in the chamber causes a rush of air outward, and prevents the ingress of water to any extent while firing. Mr. Page proposes to bring the guns into sufficient proximity to an enemy's ship and fire it below the water level; the projectile will therefore pass through the water, strike and enter the enemy's ship below the water line and so contribute to its destruction. Guns so situated may be worked by the men in the ordinary way, they being in the pressure chamber.

Guns worked and discharged in compressed air chambers, according to this invention, would in most cases, be fired point blank, and would not in any case require to be elevated, but in very close quarters with an enemy they might be depressed with advantage. In practice, however, the gun might always be maintained at a uniform level, in which case the port or hole in the ship's side may be made of a size to correspond somewhat in diameter to the muzzle of the gun. The gun having been loaded and brought into position, the supply of compressed air is admitted to the gun chamber, the port is opened by the lever and the gun discharged.

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FROM THE STEAM PRESS OF JOHN A. GRAY.

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